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Hycar 2007

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Hycar 1312

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Hycar 2000 x 68

These are only a few examples of the wide ranges of Hycar American Rubbers that are tailored to meet specific requirements. For copies of available literature listing the properties of standard materials, write Dept. EP-10, B. F. Goodrich Chemical Company, 3135 Euclid Avenue, Cleveland 15, Ohio. Cable Address: Goodchemco. In Canada: Kitchener, Ontario.

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American Rubber

B.F.Goodrich Chemical Company
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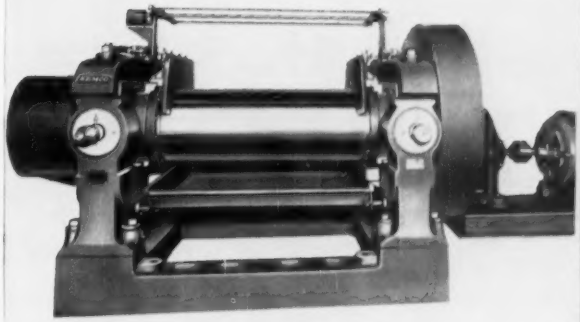

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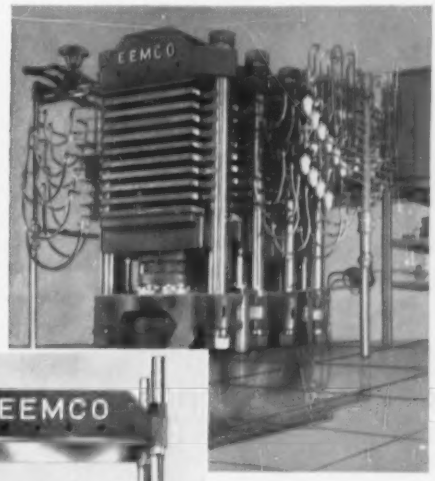
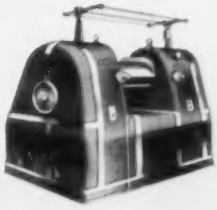


EEMCO furnishes complete installations for reinforced plastics molding—presses, hydraulic units, preform machines, roving cutters and ovens.



Call or write us for complete details. We will be glad to discuss your "Mill and Press problems"—of course, at no obligation to yourself.

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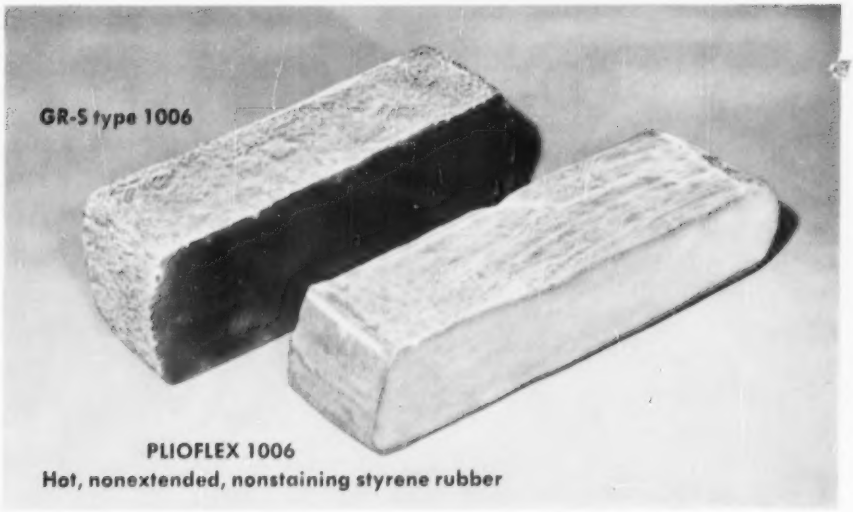
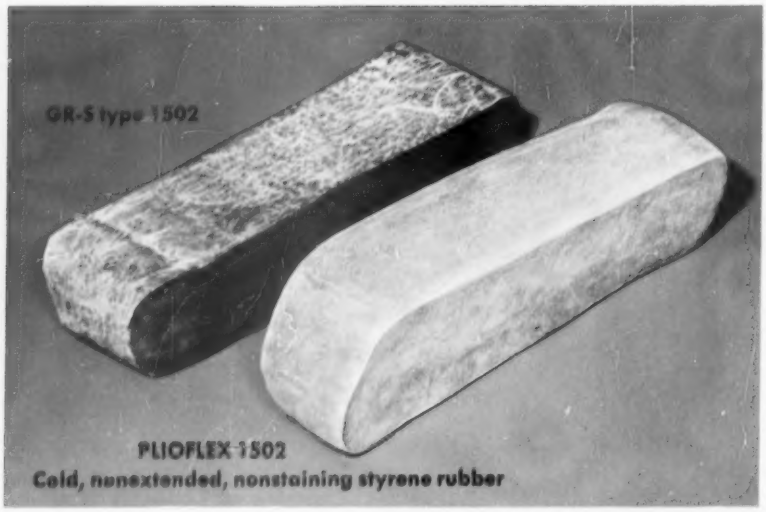
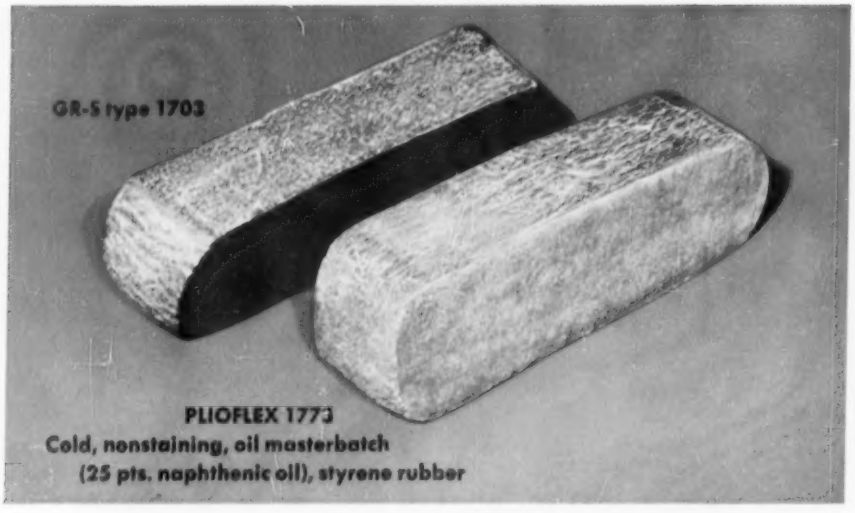


PLIOFLEX 1006
Hot, nonextended, nonstaining styrene rubber

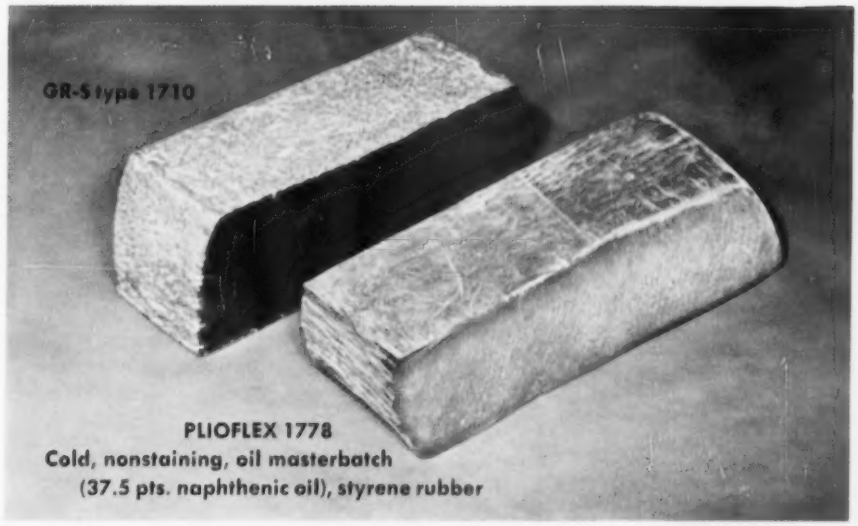


PLIOFLEX 1502
Cold, nonextended, nonstaining styrene rubber

How many



PLIOFLEX 1773
Cold, nonstaining, oil masterbatch
(25 pts. naphthenic oil), styrene rubber



new products here for you?

Pictured on these pages are unretouched photographs of various styrene-butadiene rubbers, those formerly designated as GR-S in contrast with corresponding PLIOFLEX rubbers now produced by Goodyear. They quickly tell the story of improvements made in both raw materials and manufacturing techniques to bring you the best, most complete line of nonstaining, non-discoloring rubbers ever to be offered.

But these pictures should do more than tell of past accomplishments. What about the present and the future? What thoughts do they bring to your mind about improving present products with PLIOFLEX? How many totally new products do they start you thinking about?

Probably the most significant feature of the new PLIOFLEX line lies in its ability to meet fully the demands of color-conscious consumers and to do it over a wide range of physical properties and cost. This is particularly true since the new light color of PLIOFLEX, in both nonextended and oil-extended types, combines excellent physical properties and processing characteristics at minimum cost.

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Learn more about the new, light color of PLIOFLEX, and discover how it can help you to new or improved products. Why not write, right now, for the full story, including the latest *Tech Book Bulletins*, to: Goodyear, Chemical Division, Akron 16, Ohio.

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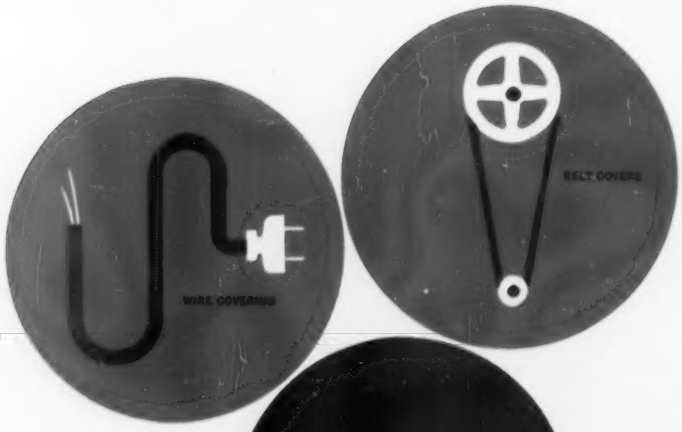
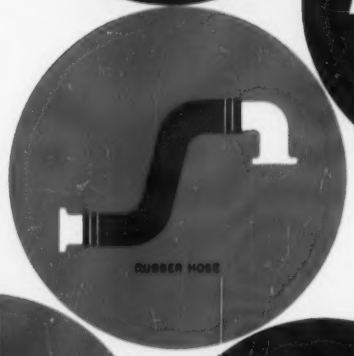


There's a Huber Oil Black for Every Need!

AROMEX ISAF

AROMEX HAF



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Rubber Age

COVERING THE MANUFACTURE OF RUBBER AND RUBBERLIKE PLASTICS PRODUCTS

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*Appears every other month

Microfilm copies of complete volumes of RUBBER AGE are available from; University Microfilms, 313 North First St., Ann Arbor, Mich.
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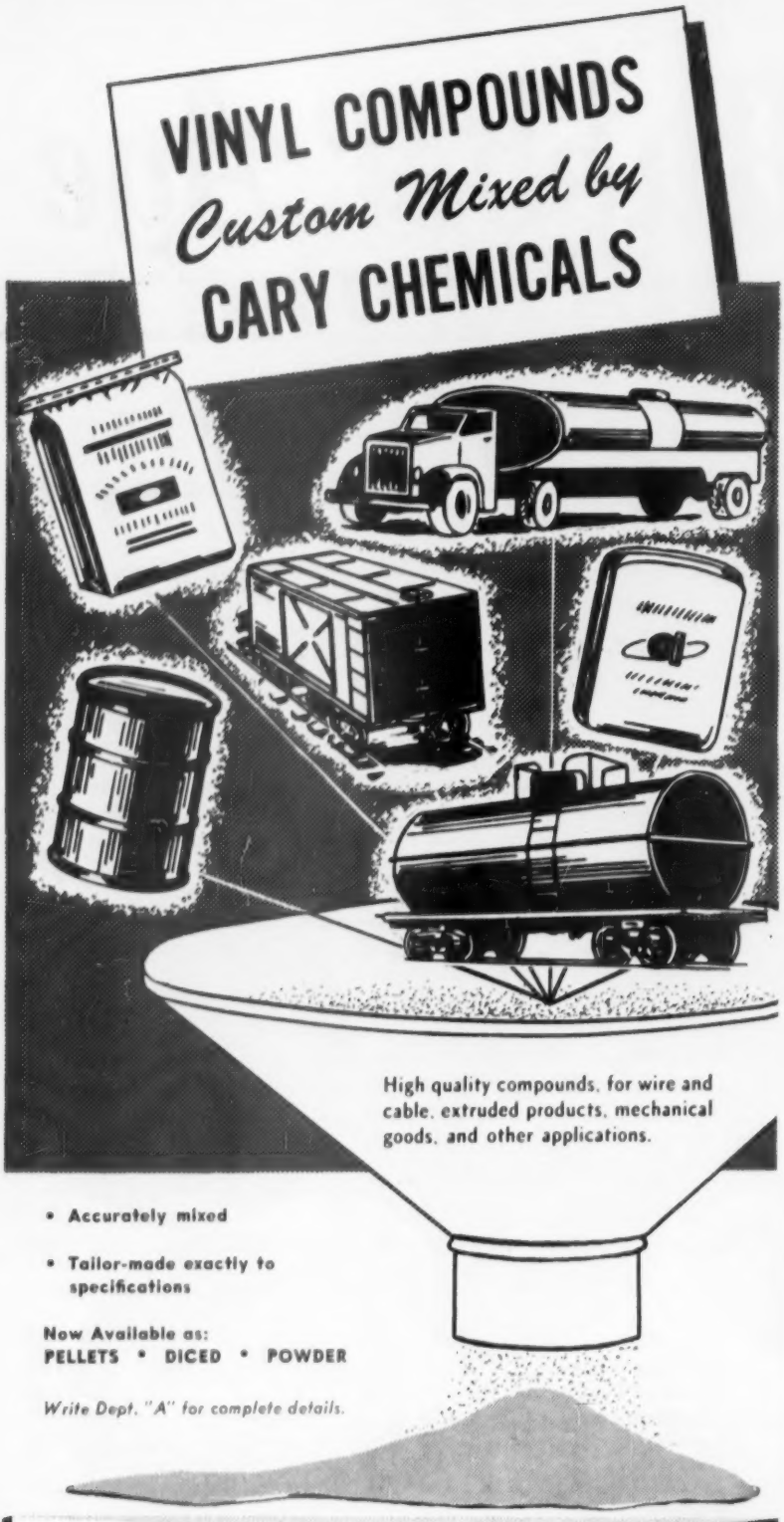
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Letters to the editor

Plea for Preprints

Dear Sir:

My span of regular attendance at meetings of the Rubber Division goes back only to 1950 so I cannot pose as an expert witness. It does seem, however, that there is an almost monotonous sameness to these sessions. The traditional kickoff by the 25-Year Club at the Wednesday luncheon signals the start of two days of frequently uninspired reading of involved technical papers.

The meetings could be shortened for everyone's benefit by adopting a system used by many European societies. Papers are preprinted and sent to the membership so that advance study may be made. At the meeting, the author presents a short abstract, then answers questions from the floor.

I heard one man at Atlantic City warning a friend against taking notes with a ball point pen—his had skipped once and after going back to fill in the gap he found himself two slides behind the speaker.

You may ask who will bear the cost of the preprints. I am sure many among the suppliers would far rather see their contributions spent this way than to throw thousands of dollars away elsewise. I refer to the Suppliers Cooperative Cocktail Party which, being free, attracts an overflow horde and accomplishes little except to allow the hotels an opportunity to use up their surplus bargain whiskey and some of last week's leftovers.

It has also been suggested informally that the suppliers' donations be used to partially subsidize the banquet or floor show. I would also favor something along this line to provide a function which could be priced to appeal more generally, and improve the standard fare of indifferent food and an often dull and disorganized entertainment.

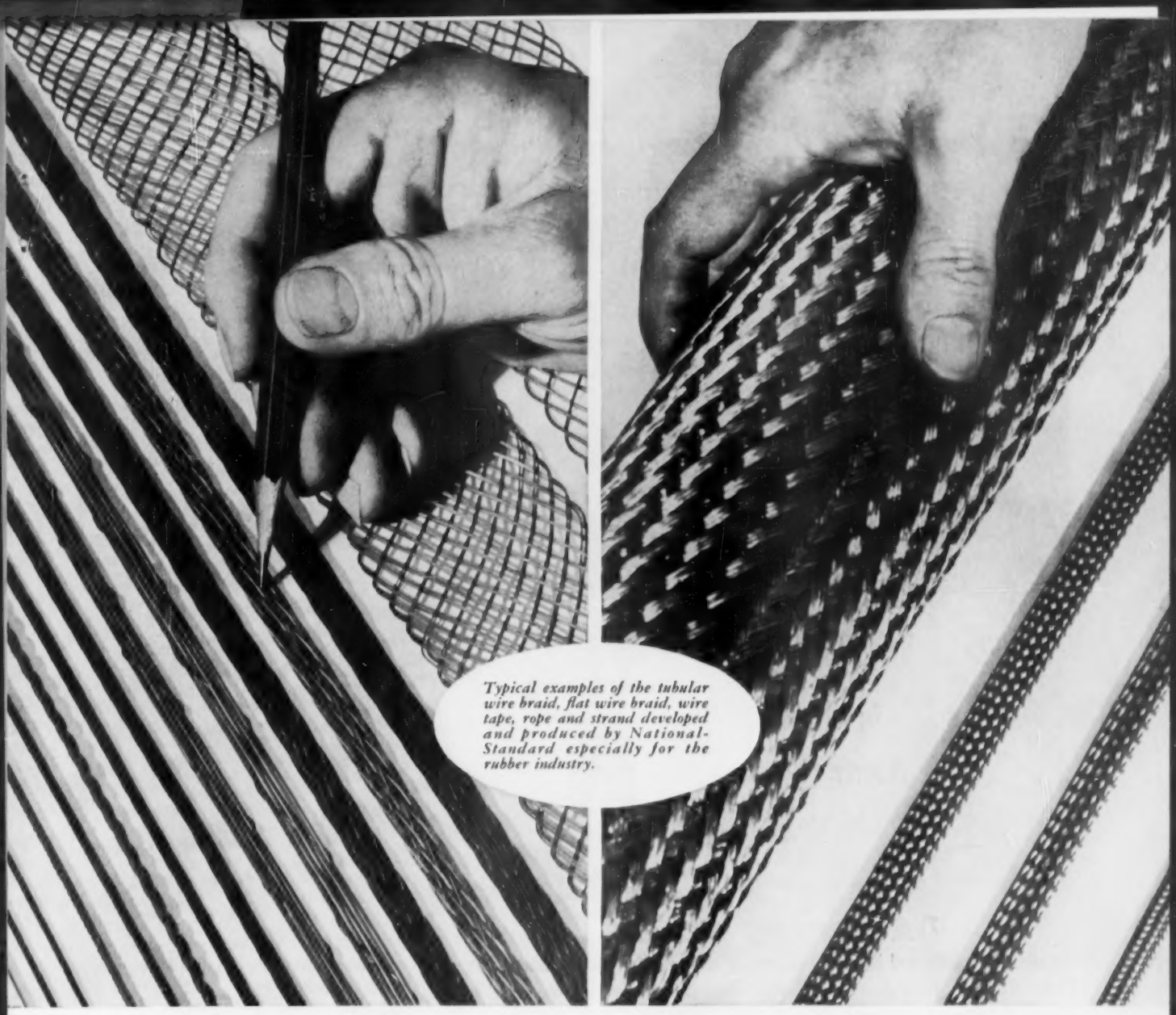
ROBERT M. SIMPSON
Columbia-Southern Chemical Corp.,
Pittsburgh 22, Penna.

Fluid Urethane Rubbers

Dear Sir:

Relative to the item on processing of fluid urethane rubbers which appeared in the September issue, I think it is an attractive treatment of the subject. I am a little in doubt however, concerning the impression that I emphasized the "no pressure" requirement for the processing of fluid urethanes. This understanding may have resulted from the fact that the illustration shows that vacuum is applied over the two vessels. Actually, the vacuum is used to deaerate the two components of the system in order to expel any entrapped air, and thus avoid bubbles in the final molding.

A. C. STEVENSON
DuPont, Elastomers Division,
Wilmington, Delaware



Typical examples of the tubular wire braid, flat wire braid, wire tape, rope and strand developed and produced by National-Standard especially for the rubber industry.

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So, wherever wire and rubber must work together, it is more than likely that National-Standard can contribute—particularly where new production or new service requirements are involved. We want to be of help . . . and are geared to do it well, without obligation. Check with us now . . . or anytime!

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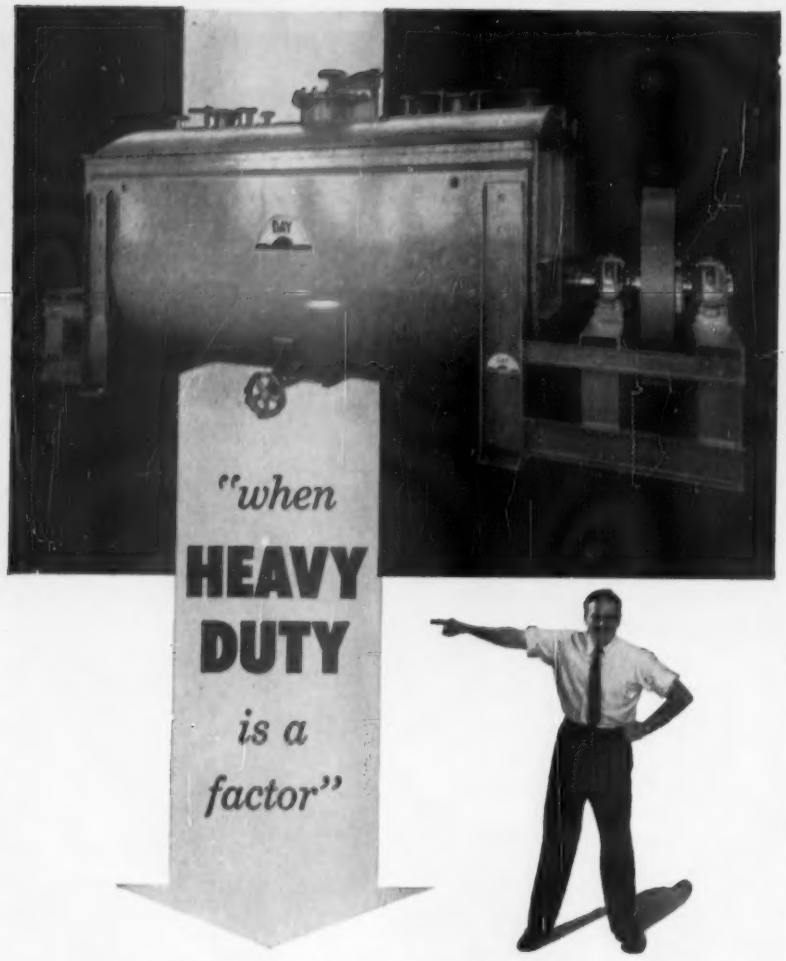

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Tree Snakes, Anyone?

Dear Sir:

I had a plum tree that bore heavily but each year every plum was ruined by birds. I had an imitation snake which I placed in the tree on a small branch which moved a little in the wind. After that I never lost a plum from damage on that tree by birds.

If manufacturers of rubber goods would make good-sized imitation snakes, each colored to imitate snakes common in the area where it is to be sold, and if the goods thus made were properly advertised, there would be a market for sales. Producers of nuts, strawberries, soft fruits and other crops would find it profitable to own the new repellents. The imitation snakes would last for many years, be easily placed and waterproof. The demand for them might be worldwide.

OWEN R. WASHBURN
625 La Rue Avenue,
Reno, Nevada

Proper Credit

Dear Sir:

With reference to our paper "Infrared Spectrophotometric Evaluation of Ozone Induced Chemical Changes in Antiozonants for Elastomer Compounds," in your issue of September, 1956, it should be noted that this work is another in a series reporting progress and accomplishments in the Navy's applied research program on elastomer deterioration being conducted under the sponsorship of the Bureau of Ships, under the general direction of Mr. T. A. Werkenthin, Head of Elastomers Branch, Research and Development Division, Bureau of Ships, Washington, D. C.

I. J. STANLEY
B. B. SIMMS
A. D. DELMAN
A. R. ALLISON

Material Laboratory
New York Naval Shipyard
Brooklyn 1, N. Y.

Re Rubatex Products

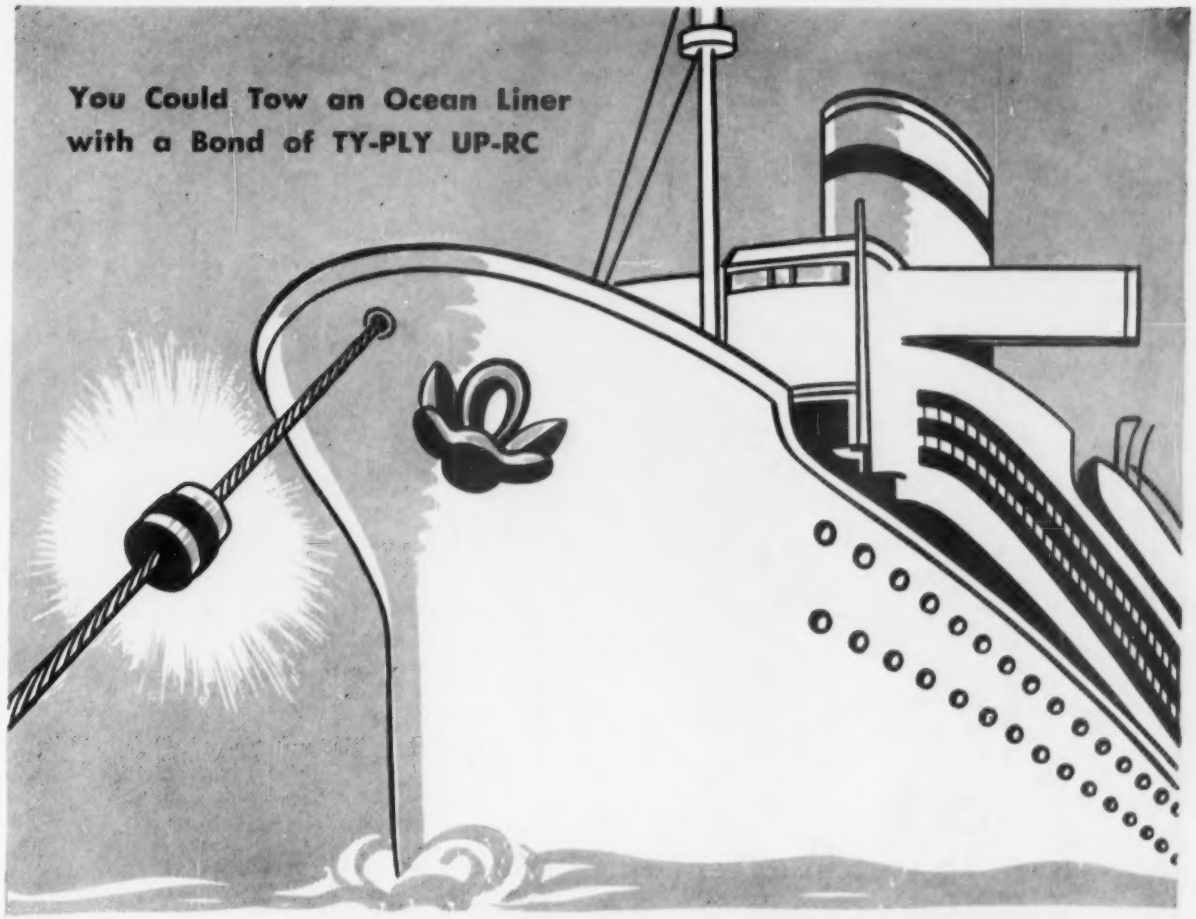
Dear Sir:

In your review of a recent issue of the Newsletter of Rubatex Products, Inc. (RUBBER AGE, Sept., 1956, p. 984), it is stated that "the company produces such (cellular) products". This company does not manufacture products of any kind, being solely a patent-licensing corporation.

Perhaps the name of this company has been confused with that of the Rubatex Division of Great American Industries. The only relationship between the two companies is that of licensor and licensee, respectively.

R. J. NOBLE
Malden 48, Mass.

We invite comments for publication in these columns. Address the Editor, RUBBER AGE, 101 West 31st St., New York 1, N. Y.



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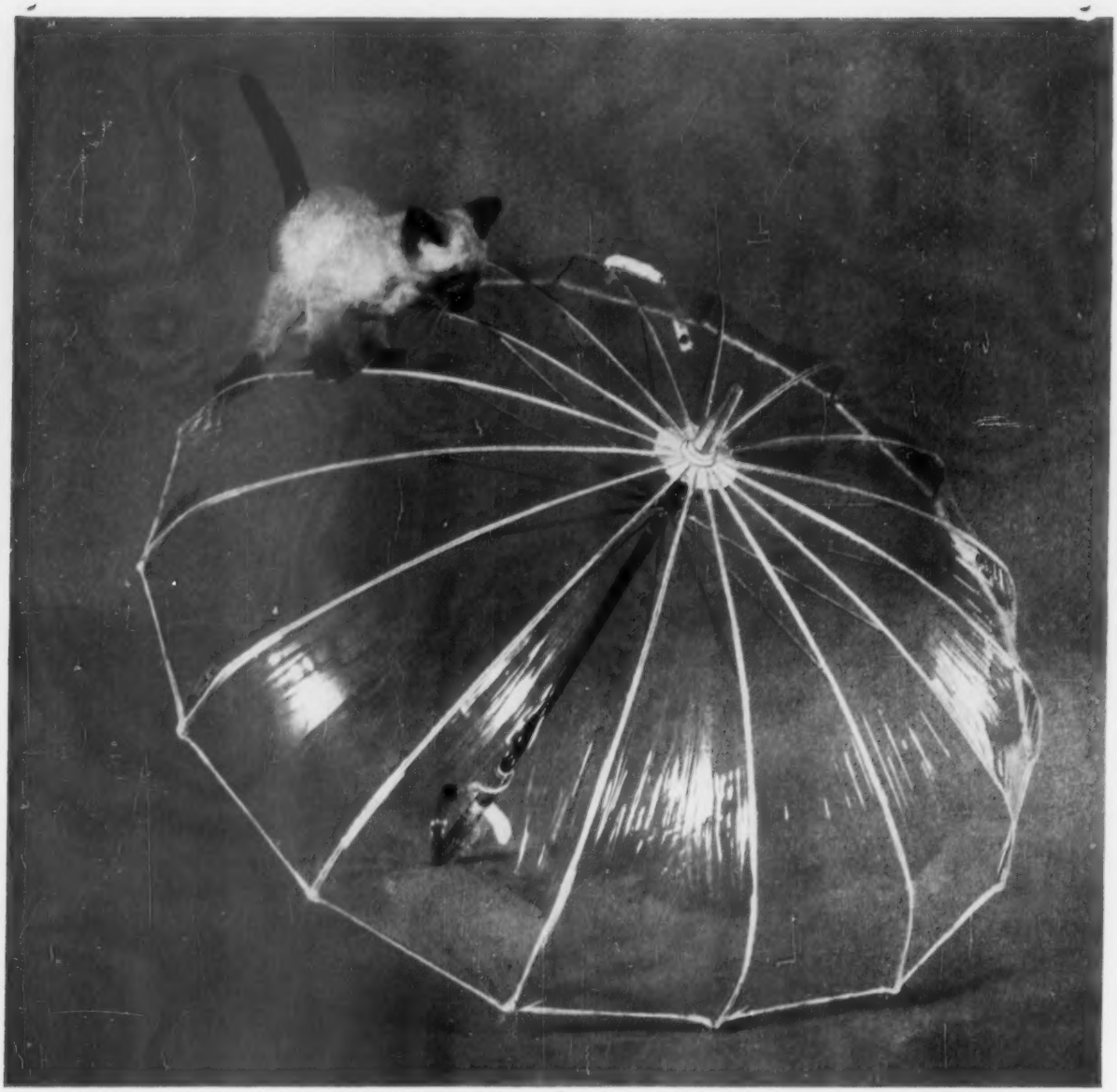

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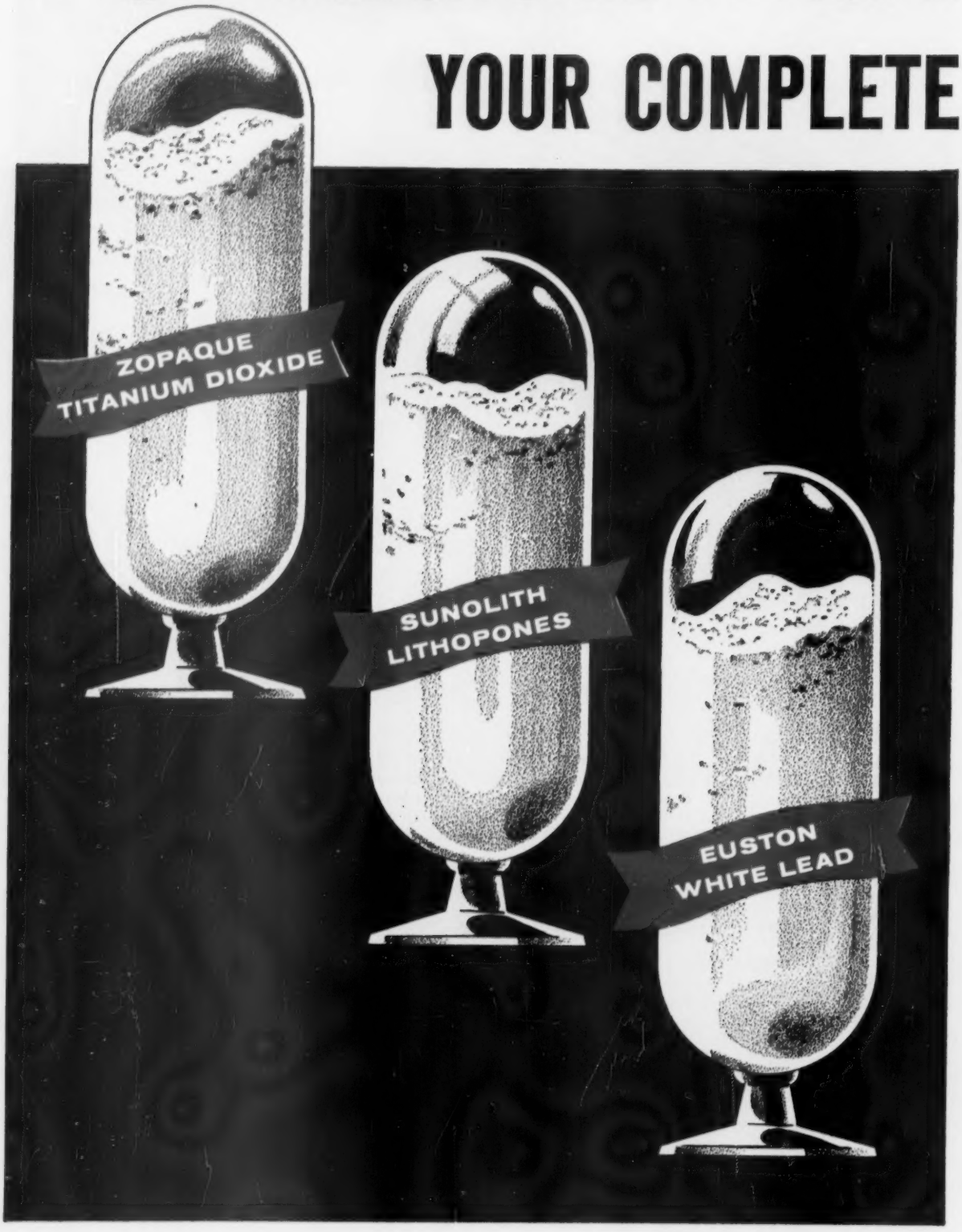

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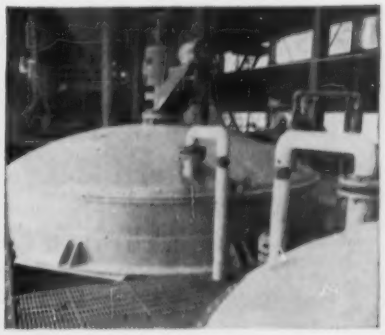
Improved facilities and processing efficiency at its Collinsville, Illinois plant, enable Glidden to meet the steady demand for SUNOLITH Lithopones . . . available in a wide range of grades, including Titanolith (titanated lithopone) with higher hiding value than regular lithopones.

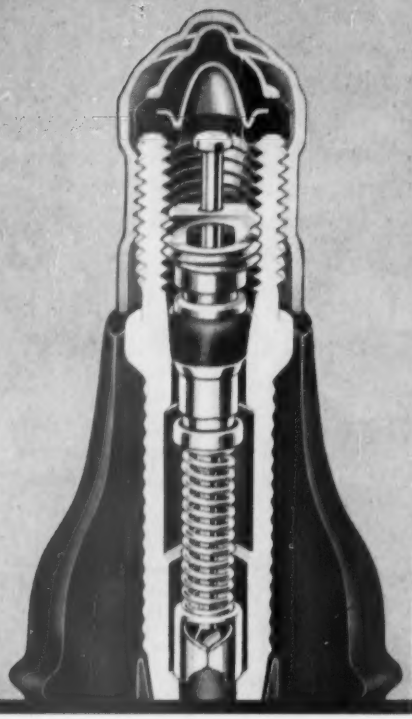
EUSTON WHITE LEAD

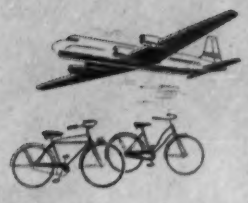
Highest quality basic lead carbonate available

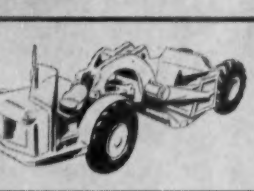


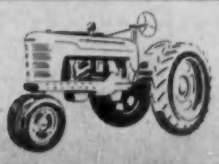
Continuous research and development at Euston Lead Division, Scranton, Pennsylvania, produce white lead of highest purity and quality. EUSTON White Lead has lower oil absorption than other white pigments. Finer, more uniform particles assure rapid solution, exceptional suspension. Various grades.

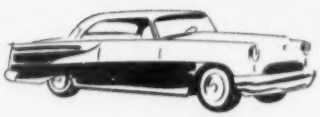
LOOK TO SCHRADER...











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tire valve products
for all types of
vehicles**

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ESTABLISHED IN 1844

FIRST NAME IN TIRE VALVES FOR
ORIGINAL EQUIPMENT AND REPLACEMENT

A New Non-Staining Rubber Antioxidant with Superior Characteristics

Nevastain A is an excellent non-staining, non-discoloring antioxidant with very low volatility and good stability. Synthetic and natural rubber compounds using Nevastain A have superior physical characteristics over those containing competitive non-staining antioxidants. Among its virtues are that it does not retard vulcanization, does not have an accelerating effect and does not bloom uncured or cured stock when used in normal quantities. This new product is being produced on a plant scale and is readily available and attractively priced. Use the coupon below to write for Technical Service Report No. 45.

Neville Chemical Company, Pittsburgh 25, Pa.

Resins—Coumarone-Indene, Heat Reactive, Phenol Modified Coumarone-Indene, Petroleum, Alkylated Phenol • **Oils**—Shingle Stain, Neutral, Plasticizing, Rubber Reclaiming • **Solvents**—2-50 W Hi-Flash, Wire Enamel Thinners.

NEVILLE

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These are the well-known trade marks of some of our customers . . . their products being recognized country wide for unequalled performance. United's experience of over fifty years and our distinguished product performance and service can help you maintain desired standards of production quality.

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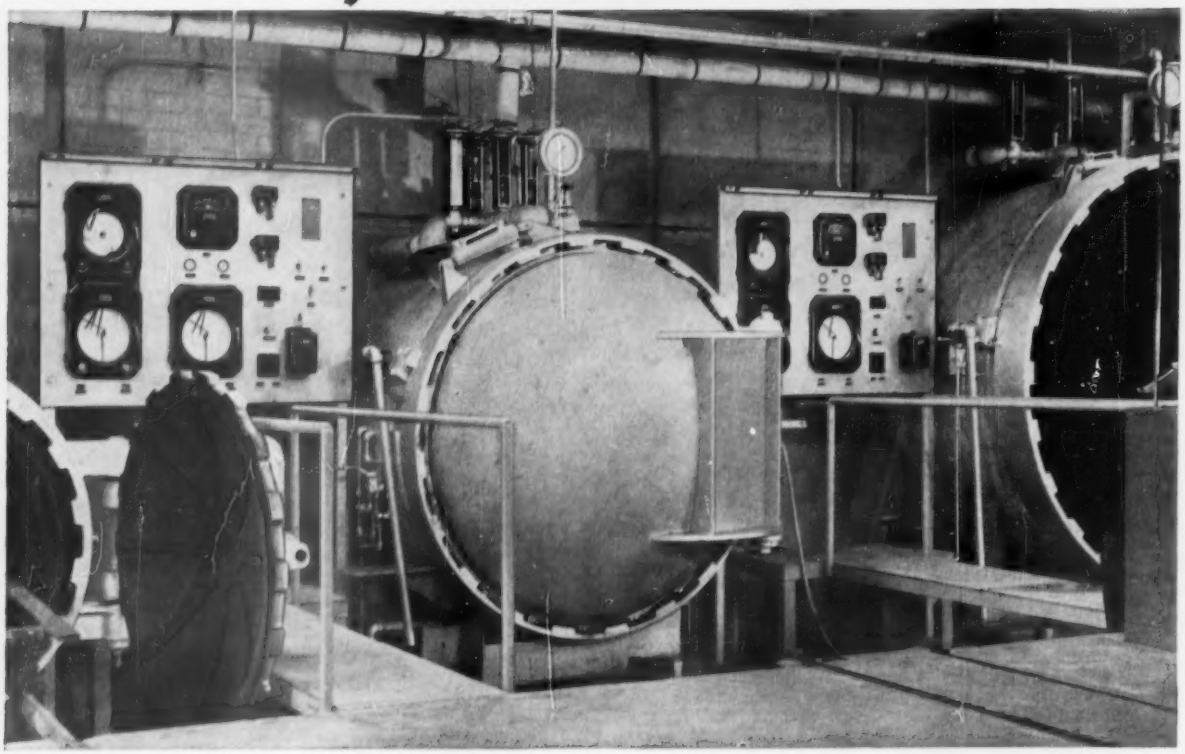
WILLETTE

Curing Problems?

TAYLOR CURES 'EM!



Taylor Control Systems give Stowe-Woodward automatic control of complete curing cycle!

HERE are the horizontal vulcanizers used by Stowe-Woodward, Inc., in Griffin, Ga., in making their high quality rubber covered rolls so widely used in paper making and textile finishing.

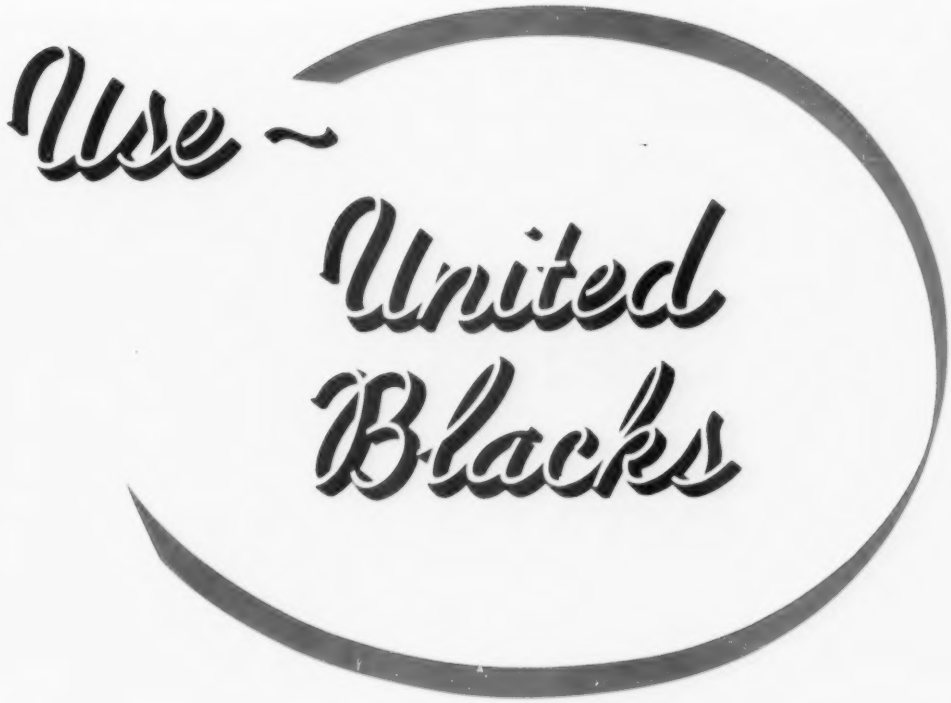
Here, too, are the panels of the Taylor Control Systems that give Stowe-Woodward *uniform cures with minimum operator attention and smallest chance of costly human error!*

Stowe-Woodward's *complete curing cycle is automatically Taylor-controlled* on a time, temperature and pressure basis. Shown here are a Time Schedule Controller and Temperature and Pressure Controllers and Recorders.

Note that these Taylor panels are installed *away from* the vulcanizers. This means handier access to working areas and lets operators check performance at a central point. Stowe-Woodward gets better "housekeeping" and care of equipment this way, too.

For details on just how Taylor Control Systems can "cure" your rubber processing worries, call your Taylor Field Engineer or write Taylor Instrument Companies, Rochester, N. Y., or Toronto, Canada.

Taylor Instruments
MEAN
ACCURACY FIRST
IN HOME AND INDUSTRY


Use ~
United
Blacks

Use ~ United Blacks

KOSMOS 20

Kosmos 20, Semi-Reinforcing (SRF) furnace carbon black, boasts by far the widest applications in various types of rubbers, and is indispensable to ever so many compounders.

Kosmos 20 is non-staining and is most uniform. It is characterized by high loading capacity; easy and smooth processing; softness; a good balance of tensile, modulus, and high resilience; low heat build-up; high resistance to flexing; and improved aging — all this plus low volume cost.

Kosmos carbon blacks are in the front for unsurpassed performance. It is wise to standardize on United carbon blacks and stay in the lead.

UNITED CARBON COMPANY, INC.

A subsidiary of United Carbon Company

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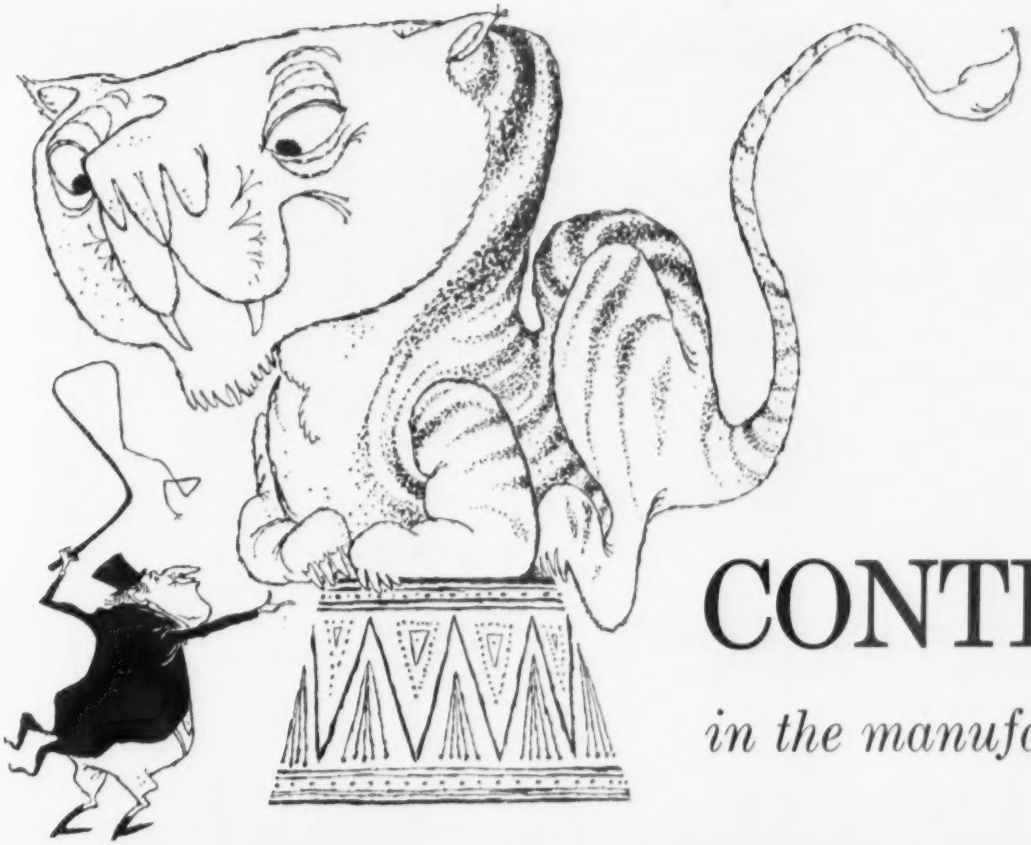
IN CANADA: CANADIAN INDUSTRIES LIMITED



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Please send me a copy of your bulletin describing PICCOLYTE Synthetic Resins and samples of grade for (application)

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depend on Quality Reclaim!

From garden hose to battery cases, reclaimed rubber is being used in thousands of rubber products today. The manufacturers of these products know that cost-cutting must not interfere with ***quality***, so they specify Pequanoc Reclaim.

As these manufacturers will attest, Pequanoc's value lies in its trouble-free processing and continuous uniformity. Characteristics such as these are the result of 55 years of experience and know-how in reclaim manufacture.

If you are interested in reducing your costs, while maintaining quality, call or write Pequanoc today. Our Technical Service Department will be glad to assist you.

Pequanoc Rubber Co.

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MAIN SALES OFFICE and FACTORY: BUTLER, N. J.

Manufacturer of Reclaimed Rubber for over half a century.

IT'S EASY TO TELL WHICH EXTRUSION HAS THE

SYNPOL 1009

FOR RUBBER PRODUCTS NEEDING THESE PROPERTIES

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- **Clean, precise definition**
- **Faster extrusions**
- **Proven power-savings in mixing**

Use Synpol 1009

With the addition of a small percentage of SYNPOL 1009 you reduce shrinkage to the minimum, save power in mixing and produce a faster extruding stock with outstanding dimensional stability.

The photo on top shows a butadiene-styrene copolymer extrusion that through blowing and swelling has a distorted profile, and surface imperfections. In the lower photo, by the addition of 10% SYNPOL 1009, irregularities have been eliminated. There is no jaggedness of the edges. The extrusion is smooth and well defined. These advantages can also be obtained by blending SYNPOL 1009 with natural rubber or neoprene compounds.

If you plan to produce a new product or improve your present line, write for processing data and compound formulations from your TEXUS technical sales representative.

Carload Pooled Shipments

Take advantage of carload discounts by pooling all your requirements from SYNPOL grades and types—the broadest available line of butadiene-styrene rubbers which includes: 1000, 1001, 1002, 1006, 1007, 1009, 1012, 1013, 1061, 1500, 1502, 1551, 1703, 1707, 1708, 1711.

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MR. CLIMCO SAYS...

A CLIMCO LINER outwears several plain liners!

Climco Liners last longer because of their non-sticking quality, increased tensile strength and lasting flexibility.

In addition to reducing fabric purchases, Climco Liners also cut production costs — because they separate perfectly from the stock, down-time due to stock adhesions is eliminated. Tackiness of the stock is preserved, gauges are more easily maintained and latitude in compounding is enlarged. There is no lint or ravelings with Climco Liners and they can be stored horizontally if desired.

Since 1922 Climco Processed Liners have proved their worth to the rubber industry. Give them a trial in your plant.

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Tells all about Climco Liners and Linerette and how to get better service from liners. Write for your copy now.

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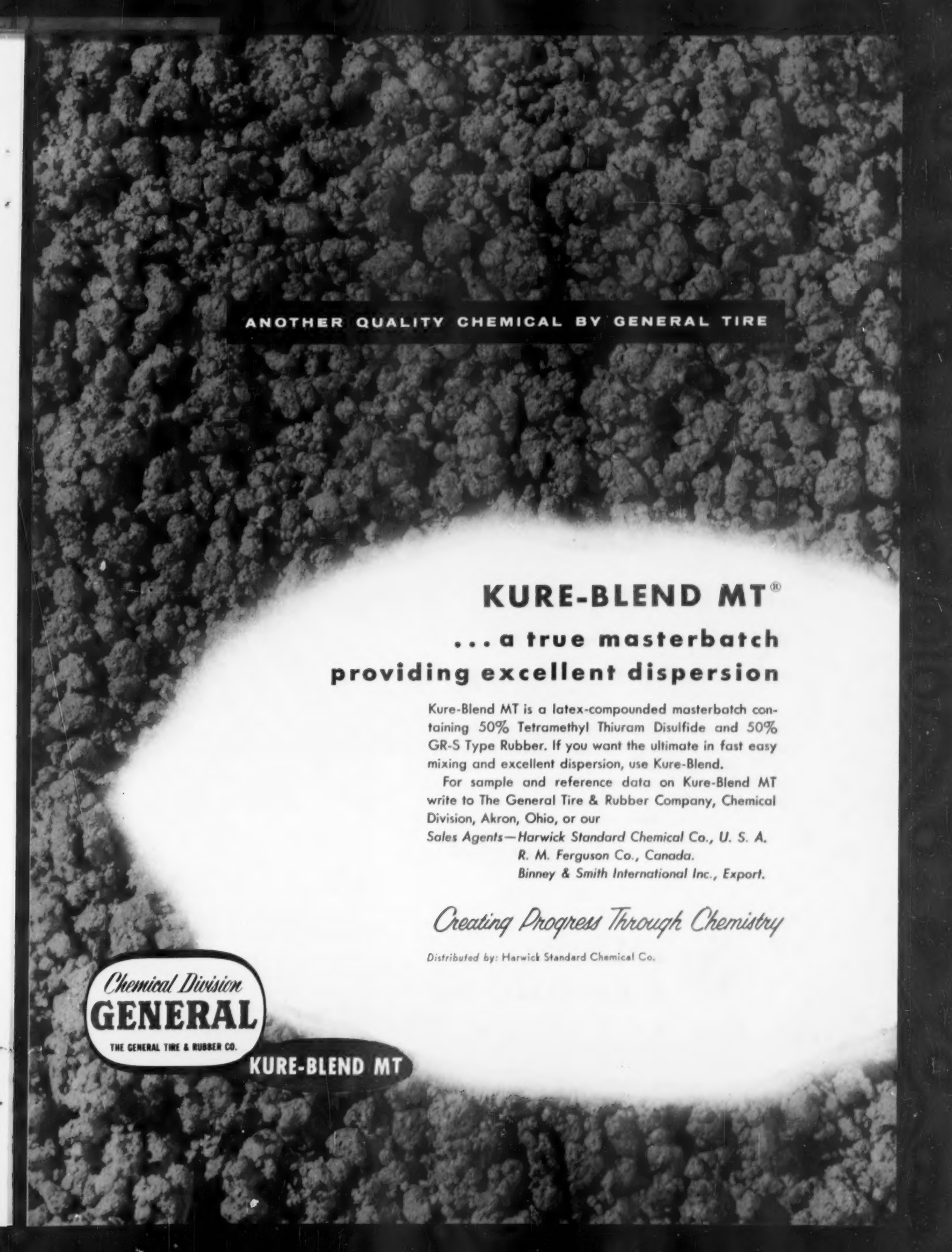
Treatment Contains
NO OIL OR WAX
Samples on Request

CLIMCO
PROCESSED LINERS
Serving the Industry Since 1921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KURE-BLEND MT®
. . . a true masterbatch
providing excellent dispersion
Kure-Blend MT is a latex-compounded masterbatch containing 50% Tetramethyl Thiuram Disulfide and 50% GR-S Type Rubber. If you want the ultimate in fast easy mixing and excellent dispersion, use Kure-Blend.
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In coated fabrics— Kalite® gives you excellent calendering

Here's a semi-reinforcing filler—DIAMOND KALITE—that will improve surface smoothness and reduce shrinkage in calendered compounds.

KALITE

DIAMOND recommends KALITE for light, pastel or dark-colored, highly loaded, soft rubber compounds requiring low stiffness and high elongation. At proper loading, it increases tear resistance and tensile strength. KALITE also makes it easier to process calendered scrap by eliminating tackiness and stickiness.

In extruded compounds—insulated wire, inner tubes—KALITE permits higher tubing speeds by improving the flow of compounds. KALITE mills with extremely low heat generation.

Call your DIAMOND representative today for information and technical help on KALITE and other top-grade calcium carbonates. Or write DIAMOND ALKALI COMPANY, 300 Union Commerce Building, Cleveland 14, Ohio.

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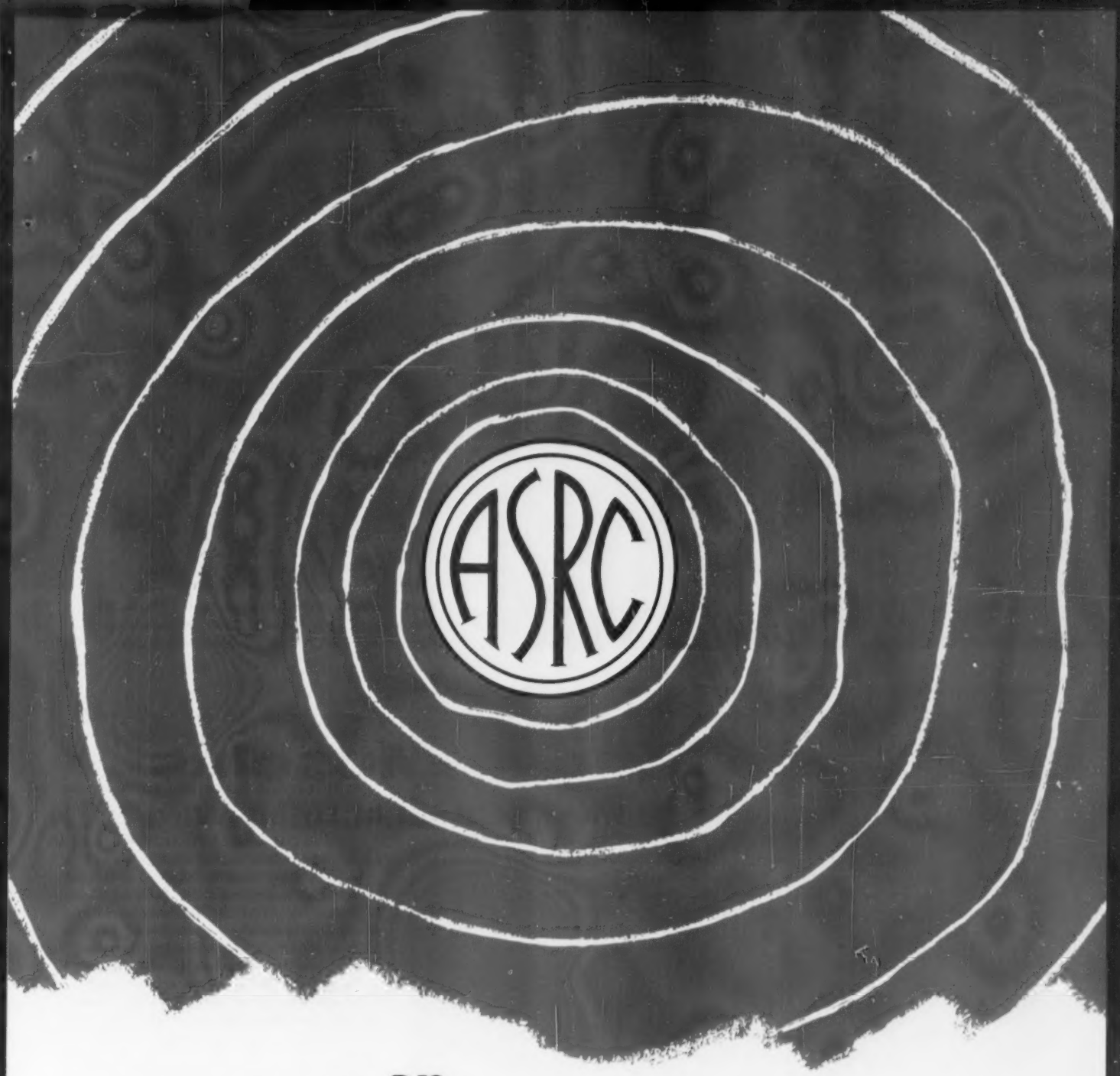

...an expanding symbol of quality and service in synthetic rubber!

Current Polymers

Cold	Class
ASRC 1500	Staining
ASRC 1502	Non-staining
Cold Oil	
ASRC 1703	Non-staining
ASRC 1708	Non-staining
Hot	
ASRC 1000	Staining
ASRC 1001	Slightly staining
ASRC 1004	Staining
ASRC 1006	Non-staining

AMERICAN SYNTHETIC RUBBER CORPORATION

Plant and General Offices: Louisville, Kentucky • Executive and Sales Offices: 500 5th Ave., New York 36, N. Y.
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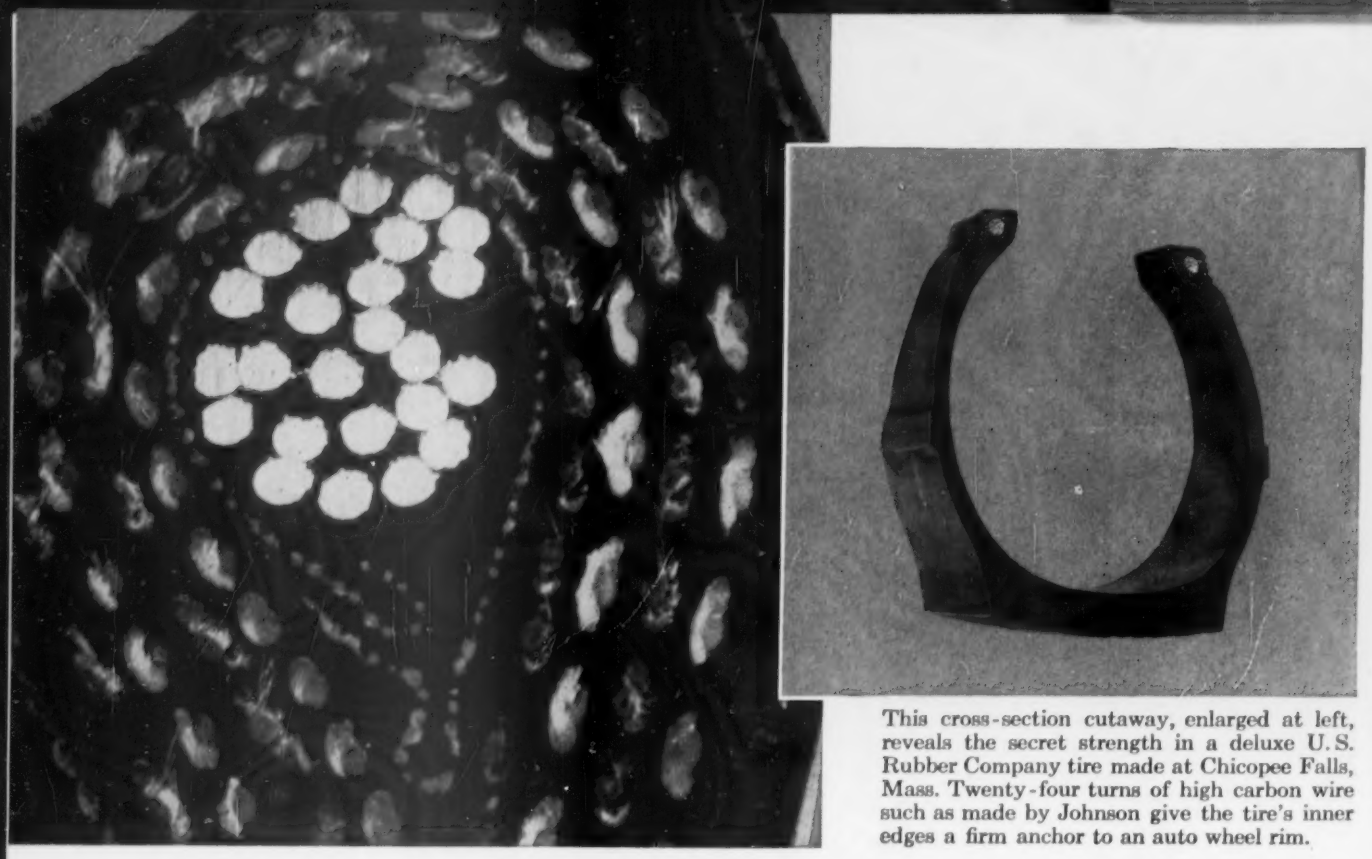

This cross-section cutaway, enlarged at left, reveals the secret strength in a deluxe U. S. Rubber Company tire made at Chicopee Falls, Mass. Twenty-four turns of high carbon wire such as made by Johnson give the tire's inner edges a firm anchor to an auto wheel rim.

Johnson Wire Used For . . .

A Tire's Hidden Muscles

U. S. Rubber Demands Best in Bead Wire

United States Rubber Company's big Chicopee Falls (Mass.) plant is "tire technology" in action. And if there isn't such a term as tire technology, there should be.

This special type of knowledge has kept automobile tires apace with automotive advances of the past 40 years. As American automobiles became heavier, stronger, speedier and more powerful, the tires they moved on developed new ruggedness and versatility.

Back in 1916, for example, the average auto weighed roughly 1,500 pounds. An average weight today might be in the 3,500-pound range, more than double.

Tire carcass strength today is twice that of 40 years ago.

Blue-chip tiremakers like U.S. Rubber will tell you of the many factors behind today's tougher tires. Some of them are visible in the finished tire—like improved design and better tread patterns. The invisible improvements—made possible by closer quality control, more efficient production machinery, better basic materials, such as the steel wires in the tires—all have contributed to producing more durable tires.

U.S. Rubber applies all these factors at its Chicopee plant, the largest tire plant east of the Alleghenies. Chicopee can turn out a new automobile tire every four seconds of a working day.

First step in making a tire is "wiring it for strength." This strength comes from the steel tire bead in the edge of each tire. A special high-carbon steel wire—about $\frac{1}{32}$ inch in diameter—is rubber coated and wound into a coil containing as few as three or up to hundreds of continuous turns. The number of turns in a bead is determined by the end usage the tire is to get. At U.S. Rubber, the number of turns for an automobile tire would range from 16 to 24, depending on the grade of tire. For one tire size, approximately 146 feet of wire are used per tire.

The coated wire is wound into the bead and a tape-like covering is applied to keep the coil solid. The bead is then incorporated into each inner edge of the tire, giving strength to the tire wall while serving as a practically unbreakable anchor holding the tire against the wheel's rim.

Because bead failure means tire failure, U.S. Rubber insists upon the finest in bead wire. That's why Johnson Steel & Wire Company, Inc., has developed into a major bead wire supplier to the Chicopee plant over the 25 years.

U.S. Rubber maintains rigid standards to insure getting wire of uniformly high quality. An order for wire or any other tire material is never placed until U.S. Rubber's quality control technicians have run complete quality tests.

In everyday operations, one in every 10 of the 600-pound reels Johnson ships to Chicopee is completely tested for tensile strength, elongation and straightness.

Johnson meets U.S. Rubber's specifications which, in part, call for wire that:

- **Presents a clean,** unbroken surface.
- **Has a good and uniform** bronze finish. Variation in the bronze coating could cause wire to freeze to a die. A poor coating also could affect the tight adhesion between the wire and rubber surrounding it. Unless this adhesion is maintained, the wire could exercise an extrusion effect which would fatally damage the tire.
- **Meets required breaking** weight standards. A single strand of $\frac{1}{32}$-inch tire bead wire has to exceed 285 pounds of breaking strength. This is equivalent to a tensile strength minimum of 275,000 pounds per square inch.

Six tire beads get their start in this machine in the Chicopee plant. Individual wires get a rubber coating here before being coiled into beads.

After each bead is tape-wrapped to hold the individual turns firmly, the bead gets a close inspection. By making a bead of one wire, the number of wire ends in a bead is reduced.

Two other standards U.S. Rubber has set apply to packaging and delivery.

In fact, Johnson's delivery and service are among the factors permitting the Chicopee plant to operate on a minimum four-day inventory for tire bead wire.

That's important because U.S. Rubber, like other tiremakers, must be cost-conscious. "This is a highly competitive business," says C. J. Allen, veteran purchasing agent at Chicopee, "and we've got to watch every cost right down to the mill."

U.S. Rubber figures it has held the line since 1931 in the cost to the motorist for every thousand miles driven. The figure 25 years ago was $4 for every thousand miles driven and it's still the same, even though the dollar is worth only half as much today and tire quality is twice that of 1931.

One of the means U.S. Rubber has followed to establish this achievement is through its insistence upon quality materials. You can have the benefit of this same advantage, if you use specialty wires. Johnson has a full range of the finest available specialty wires, as well as the engineering skill and experience required to match the proper wire to the product you make.

Whether it be wire for brushes, aircraft, bobby pins, high-strength springs, textile cards, reinforced rubber hoses or tires, you can depend on Johnson. There's full technical assistance waiting at any of the sales offices listed below.

It takes thousands of wire beads to meet daily production needs of U.S. Rubber at Chicopee, largest tire plant east of the Alleghenies.

Johnson Steel & Wire Company, Inc.

Worcester 1, Massachusetts

a subsidiary of **Pittsburgh Steel Company**

Grant Building • Pittsburgh 30, Pa.

District Sales Offices

Atlanta	Columbus	Detroit	New York	Tulsa
Chicago	Dallas	Houston	Philadelphia	Warren, Ohio
Cleveland	Dayton	Los Angeles	Pittsburgh	

RUGGED TRAFFIC CONDITIONS—Almost 1600 tons of coarse, heavy slate are transported daily by means of this sturdy 30″ conveyor belt at The Southern Lightweight Aggregate Corporation's plant in Bremo Bluff, Virginia. This slate is first carried to huge crushers and then to kilns where it is transformed into SOLITE, a unique new aggregate used in the manufacture of structural concrete and lightweight masonry units that are just as strong as ordinary concrete units, but one-half lighter. Because of the continuous barrage of sharp, angular slate to which this particular belt is subjected, it required special engineering. It was manufactured by Boston Woven Hose and Rubber Company from fabrics especially developed for extremely rough usage by Mount Vernon Mills. Already, the belt has been in continuous use for over two years and is expected to remain serviceable for at least another—twice as long as any other belt ever before utilized for this brutal carrying operation.

This is another example of how fabrics made by Mount Vernon Mills, Inc. and the industries they serve, are serving America. Mount Vernon engineers and its laboratory facilities are available to help you in the development of any new fabric or in the application of those already available.

UNIFORMITY Makes The Big Difference In Industrial Fabrics

Mount Vernon Mills, Inc.

A LEADER IN INDUSTRIAL TEXTILES

TURNER HALSEY COMPANY *Selling Agents*

Main Offices: 40 Worth Street, New York, N. Y.

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Make your products long-lasting . . .

Use

HYPALON® 20

Synthetic Rubber

for the ultimate in weather resistance

- *Bright and pastel* **HYPALON** *compositions will retain their color and elasticity after extended outdoor exposure. In fact, colors help by screening out ultraviolet rays.*
- *Carbon black is not necessary for good physical properties or for their retention after outdoor exposure.*
- *In contact with the weather,* **HYPALON** *compounds retain excellent abrasion resistance, flex life and strength during long exposure to weather.*

See Elastomers Division Report:
Report 56-4: HYPALON® 20—Principles of Compounding and Processing

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for polyurethanes
call for better glycols...
The quality of polyurethanes depends on the quality of the alkyds used in their production. In turn, the quality of the alkyds depends on the quality of the chemicals used in *their* manufacture.
Producers of alkyds for polyurethanes have found that Mathieson glycols have the necessary purity and uniformity to maintain control of end-product quality.
Mathieson ethylene glycol and diethylene glycol are shipped in tank cars, compartmented cars, tank trucks and resin-lined drums. These and other basic chemicals are strategically stocked to assure prompt delivery. Mathieson also provides expert technical assistance on manufacturing problems. Contact us whenever we may be of service.

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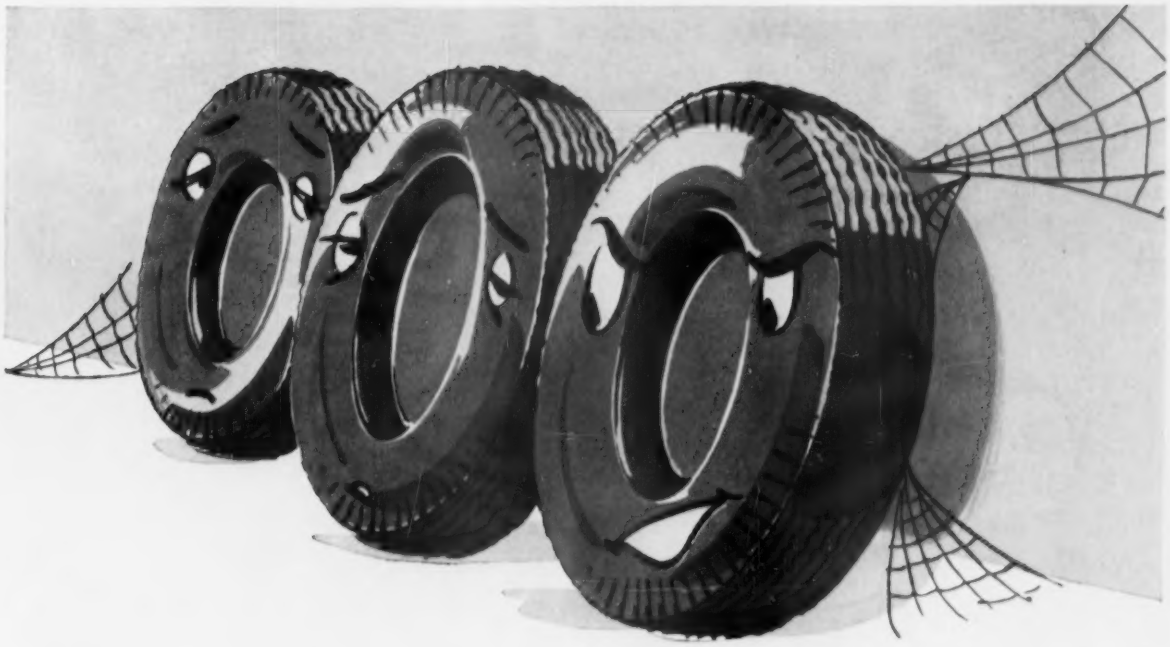


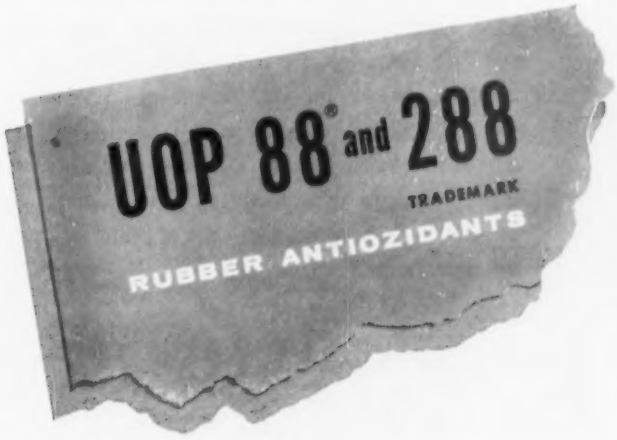
"Awright, Let's Get Crackin!"

Tires, or any other rubber products, unless effectively protected are subject to ozone attack.

Protection from ozone cracking is reliable and economical with Universal's high potency rubber antiozidants, the new UOP 288 and the widely-used 88.

These Universal antiozidants are heat stable, of finest purity, provide controlled uniformity and offer complete protection under both static and dynamic exposure.

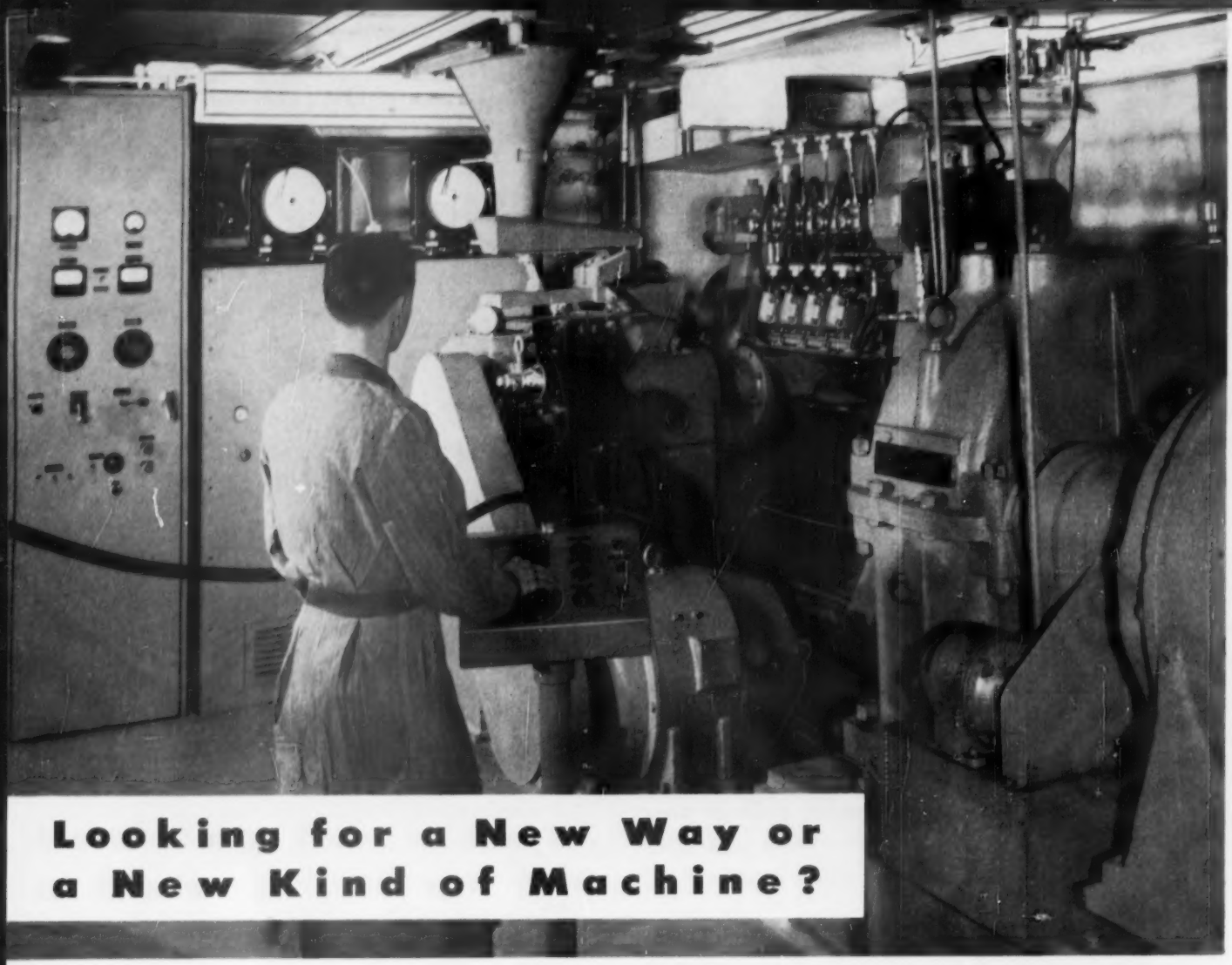
Whatever your product, from tires to hot water bottles, if it contains rubber, either natural or synthetic, let us recommend the correct UOP antiozidant formulation which will provide complete protection from ozone cracking.



PRODUCTS DEPARTMENT

UNIVERSAL OIL PRODUCTS COMPANY

30 ALGONQUIN ROAD,
DES PLAINES, ILLINOIS, U. S. A.



Looking for a New Way or a New Kind of Machine?

● **There are several ways to reduce processing costs** . . . combine some of your operations; eliminate the dollars frozen by material-in-process inventory; develop as much of a continuous operation as possible; or cut down on rejects and scrap.

These are big assignments. We know, because we make our living doing just that for manufacturers and processors of rubber and plastic.

We specialize only on rubber and plastic operations . . . no others. Naturally, all of our personnel are rubber and plastic specialists. We understand yields; how much it should cost to make a product; and what kind of equipment you need.

We build special machinery for special jobs. We continually design and build machines which have never been designed or built before. If you want a plan for improving your manufacturing costs, write us. Doing things differently for a profit — yours and ours — is our business.

Improving Costs of Manufacturing is Our Business

Sales and Engineering by

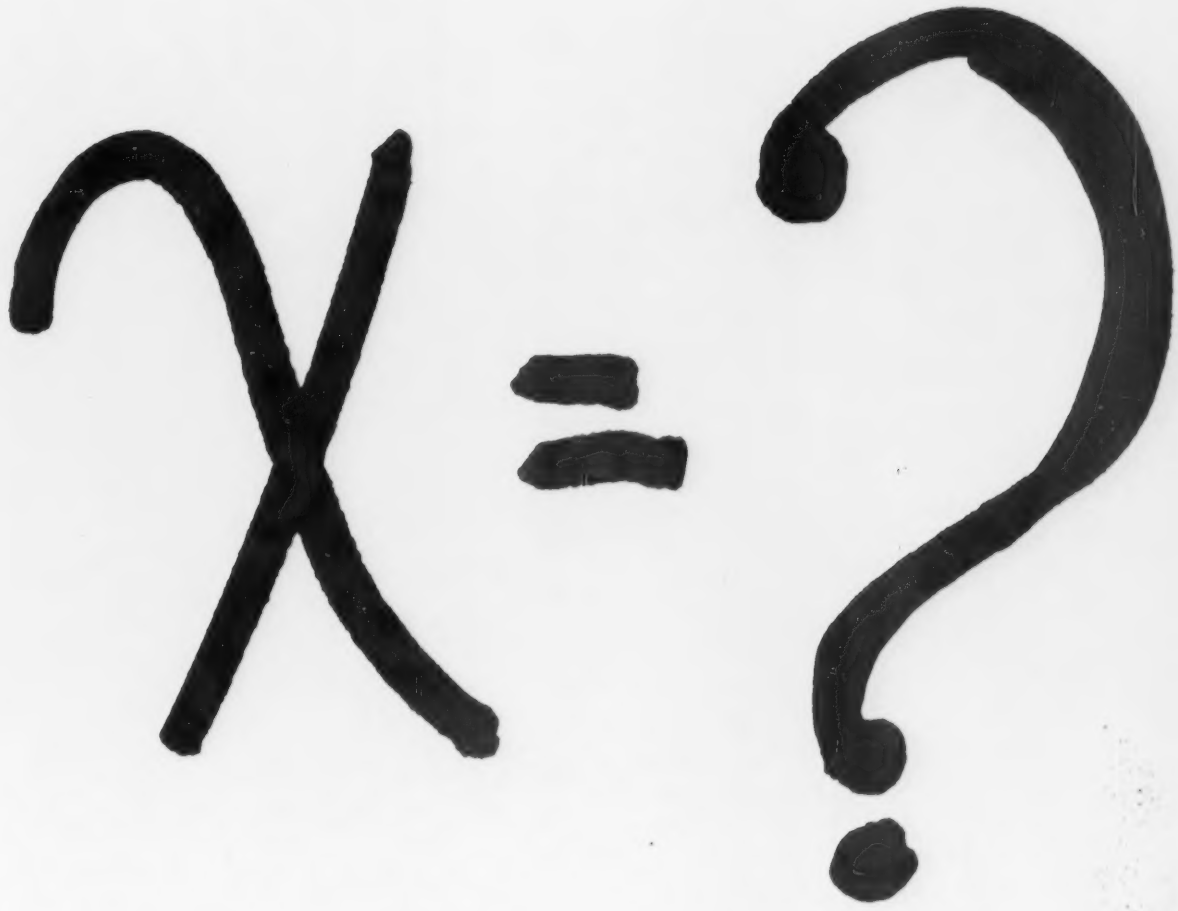
HALE and KULLGREN, INC.

P. O. Box 1231 · AKRON, OHIO

MANUFACTURED BY

THE AETNA-STANDARD ENGINEERING CO., PITTSBURGH, PA.

PLANTS IN WARREN, OHIO · ELLWOOD CITY, PA.



Answering Questions About Rubber Formulations Is Our Business

Sometimes the answers are so simple, we are surprised ourselves! Like the time a certain rubber processor brought us this one:

The Problem: What is the best non-staining antioxidant for a 55 Durometer natural rubber stock with a heavy whiting load?

Here's What Monsanto Compounders Did: Compounded a pale crepe stock with 100 parts of whiting . . . added Santowhite Crystals and also test batches including two other good commercial antioxidants.

The Results: Formulation with Santowhite Crystals showed best aging by a wide margin.

Better performance is the only way we sell. Sure, our crystals and powders are pure and pretty. But customers buy our rubber chemicals because they work not only in the laboratory, but on the production line.

Be your tonnage large or not-so-large, ask your questions anyhow. Unless your problem is so unique that it stumps the experts, the answer might require no more than riffling through the index of the more than 18,000 lab reports in our files. *Monsanto Chemical Company, Rubber Chemicals Dept. RC-1, (telephone HEmlock 4-1921), Akron, Ohio.*

Santowhite: Reg. U. S. Pat. Off.

Accelerators • For fast, slow, and regulated rates of safe cure.

Antioxidants • For maximum oxidation resistance.

Specialty Compounds • For special processing problems.

MONSANTO

ENGINEERS SERVING THE RUBBER AND PLASTICS INDUSTRY FOR OVER 30 YEARS

Is AUTOMATION the Answer . . . for You ?

What yardstick can a management man use to evaluate Automation for his company?

Will it increase productivity, decrease costs, improve product quality—and to what degree? What capital investment is required, and how can it be amortized?

These are the questions which must be answered. They are the kind of problems which clients regularly bring to G & V for analysis and solution.

Giffels & Vallet's broad experience in the planning and engineering of production facilities . . . for many companies in many industries . . . at home and abroad . . . has brought about a practical insight and understanding of the complex problems involved . . . and their solution.

This is experience available to you—in the development of new plant facilities and modernization programs.

G & V services are discussed in a special Rubber and Plastics Brochure. A copy will be mailed on request.

INDUSTRIAL ENGINEERING DIVISION

Giffels & Vallet inc.

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Plant Layout • Process Development • Automation Engineering • Materials Handling • Equipment Design • Building Design

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Antistatic and
Highly Conductive
Rubber and
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the world's most conductive carbon black

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Rubber and
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the world's most conductive carbon black

VULCAN® XC-72

An extra-conductive oil furnace black for use in rubber and plastics hospital flooring and sheeting, conductive heating pads and panels . . . rubber antistatic tires, power transmission belts, conveyor belting, soles and heels, gasoline hose, static straps and textile machinery parts . . . plastics antistatic phonograph records, conveyor belting, machinery parts . . . antistatic and highly conductive rubber and plastics compounds of all types.

Write for Technical Report RG-102 and for free samples

GODFREY L. CABOT, INC. 77 Franklin St., Boston 10, Mass.

CABOT

Here's all the data you need to choose a laboratory mill

As a valuable aid in the selection of experimental mills, Farrel-Birmingham offers this factual new bulletin. For each model, it gives such pertinent information as type of construction . . . type of drive . . . friction ratio . . . roll speeds . . . dimensions . . . etc. Discussed in detail are general specifications and design features.

Because of the wide diversification of laboratory requirements, Farrel-Birmingham manufactures a choice of laboratory mills with rolls in the popular 6" x 13" size. With the optional design features available for each, little difficulty should be experienced in selecting a mill to meet practically any need—without paying for nonessential features.

In addition, Farrel-Birmingham has a unique insight into laboratory mill requirements, thanks to experience gained as a leading supplier of processing machinery for the rubber and plastics industries.

If you are interested in laboratory mills, you will find this bulletin helpful. For your free copy mail the coupon below.

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Plants: Ansonia & Derby, Conn., Buffalo & Rochester, N. Y.
Sales Offices: Ansonia, Buffalo, Akron, Chicago, Fayetteville (N. C.), Los Angeles, Houston

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ANSONIA, CONN.

Please send me, without cost or obligation, a copy of bulletin 203.

Name.....

Company.....

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City.....State.....

Farrel-Birmingham®

FB-1088

ERIE PRESS OF THE MONTH

800-TON HOT PLATEN PRESS

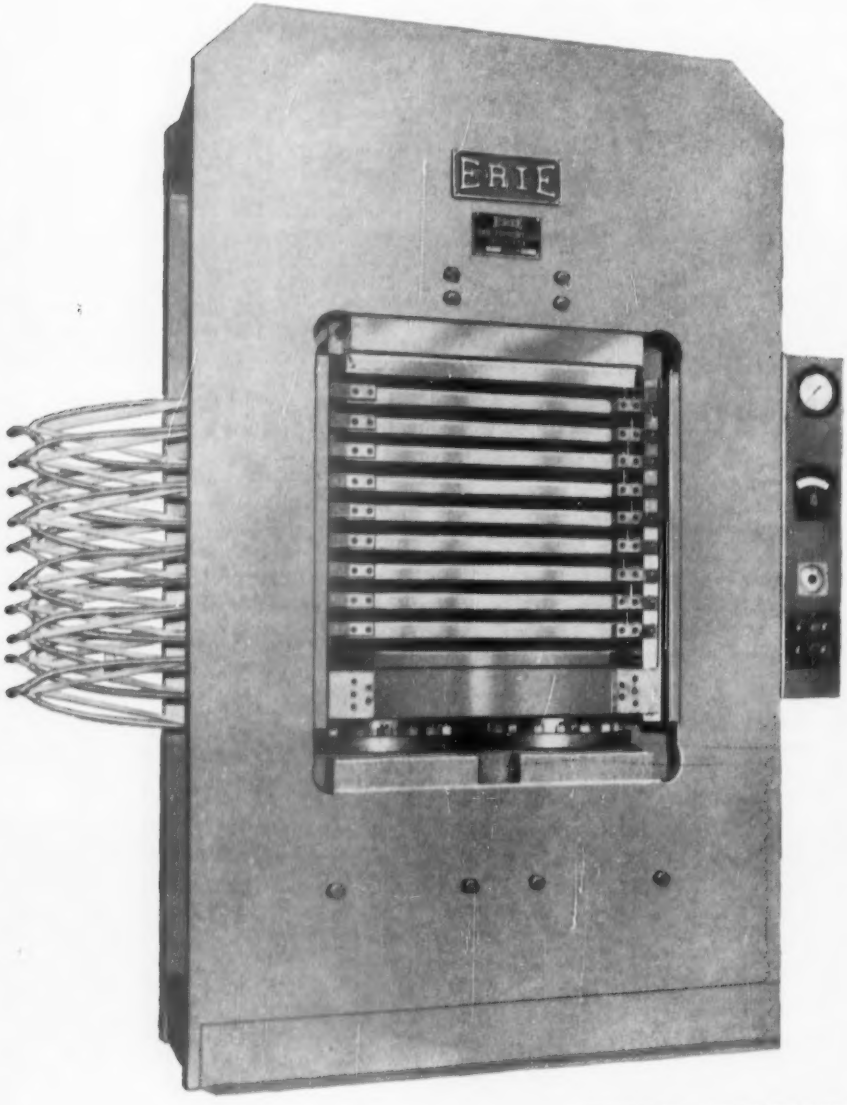
This Erie Foundry hot platen press is designed and built for precision molding. It is compact and rigid, with minimum deflection . . . yet of economical design.

The press is self-contained, with push button control for semi-automatic or manual operation. Platen guides are arranged to provide accurate alignment over the entire range of platen temperatures.

To prevent scoring of the ram, the inserted cylinders are furnished with bronze bushings in gland and stuffing box.

At present, this 10-platen press is being used in the production of printed circuits. It is equally adaptable wherever multiple-opening heated platen presses are required.

For additional information on this press or on the complete line of Erie Foundry rubber and plastic hydraulic presses, just write to: Erie Foundry Company, Erie 6, Pennsylvania.



800-TON
HOT PLATEN PRESS
2 rams 15½" dia. each
Platen size 42" x 24"
10 openings 2" each
Stroke 20"

ERIE
SINCE 1895

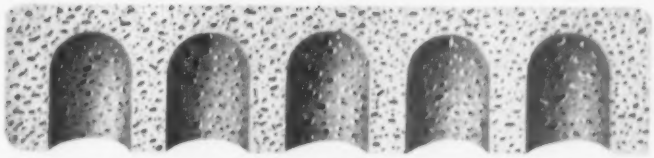
Hydraulic Press Division

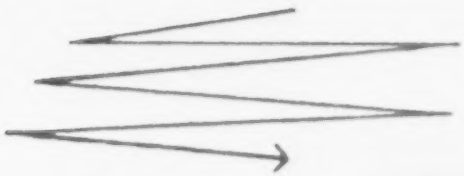
ERIE FOUNDRY CO. ERIE, PA.

improved dipping–molding–foams–coatings with a new, non-ionic latex heat sensitizer

POLYVINYL METHYL ETHER PVM

PVM has received commercial acceptance as a heat sensitizer for natural and synthetic latices because it shows the following advantages:





Compounded latices have increased stability and more extensive storage life than systems based on other types of sensitizers

Less time and lower temperatures are needed to prepare thick walled, dipped and molded articles

Controlled variations in coagulation points makes possible increased flexibility in compounding components

Continuous operation is feasible due to PVM's quick, dependable action

Synergistic action is obtained with certain heat sensitizers such as silicofluorides and ammonium complexes

Rate of deposition is increased when PVM is used even in small amounts with other sensitizers

Corrosion problems are eliminated in storage and reaction vessels

Strength of coagulants is increased in certain latex systems

Leveling action is improved in foams and coatings

Collapse of foamed products is minimized

PVM is a stable polymer with a definite temperature range of precipitation. It is not a skin irritant and has extremely low toxicity

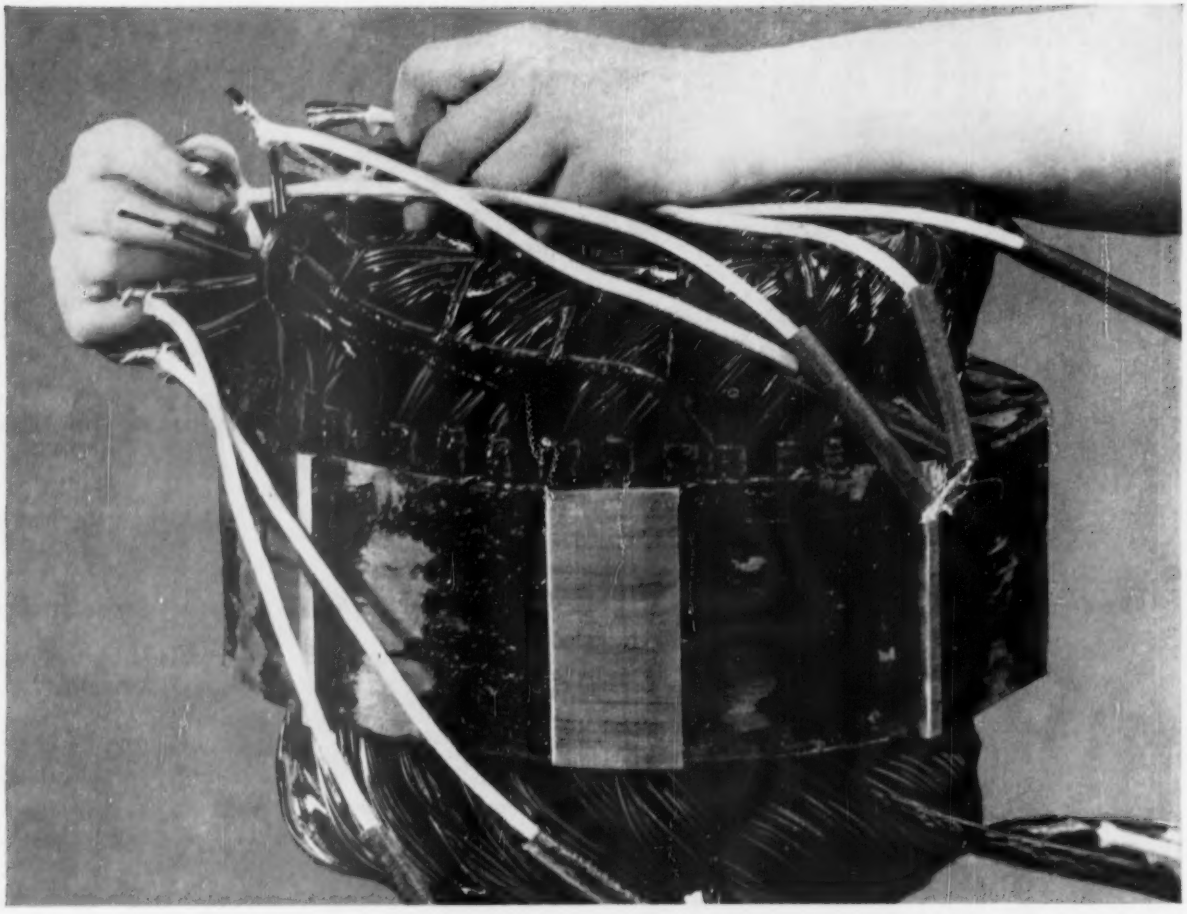
Further details on PVM as a latex heat sensitizer and typical formulations using PVM with natural rubber, neoprene, butadiene-acrylonitrile copolymers, GR-S and polyvinyl chloride latices are given in Data Sheet P120A.

For technical information, price schedules and samples write to:

GENERAL ANILINE & FILM CORPORATION
COMMERCIAL DEVELOPMENT DEPARTMENT
435 HUDSON STREET NEW YORK 14, N. Y.

gaf

From Research to Reality



SILASTIC 432 Base

Speeds Compounding of High Strength Stocks

TYPICAL PROPERTIES OF
WIRE AND CABLE COMPOUND
MADE WITH SILASTIC 432 BASE

Temperature range, °F	—100 to 500 F
Specific gravity	1.52
Hardness, durometer	60
Tensile strength, psi	600
Elongation, %	180
Insulation resistance, megohms/1000 ft.	1700
Dielectric constant, 10^2 cycles	3.35
Dissipation factor, 10^2 cycles	.004

All properties except IR obtained on ASTM molded slabs cured 5 minutes at 260 F. IR obtained on No. 18 stranded wire 1/32" wall, hot air vulcanized for 30 seconds at 740 F.

When it comes to quick, easy compounding of silicone rubber stocks with superior *physical properties*, there is no other gum available like Silastic® 432 Base. What's more, this unique Dow Corning gum has remarkable shelf stability . . . low moisture absorption . . . low compression set—without toxic additives . . . and can be compounded to withstand temperatures from —100 to 500 F. Stocks made with Silastic 432 Base assure highest performance standards for molded, extruded, or calendered parts.

Do you want the recipe and complete compounding instructions for this wire and cable compound using Silastic 432 Base? It's yours for the asking . . . just contact the nearest Dow Corning branch office for prompt service.

***FREE SAMPLE** . . . Try Silastic 432 Base in your own plant. Write today.*

Address Dept. 9210

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SHELL DUTREX

PLASTICIZERS and EXTENDERS

For GR-S and Natural Rubber

General purpose applications

Dutrex 6
Dutrex 7
Dutrex 6H (SPX-97)
Dutrex 20
Dutrex 15E
Dutrex 15W

Non-staining or light colored stocks

Dutrex 39
Dutrex 32

For Butyl Rubber

Dutrex 31
Dutrex 32

For Nitrile Rubber

Dutrex 21
Dutrex 25

For Neoprene W types

Dutrex 6
Dutrex 20

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SHELL

Versatile

is the word for

POLYMEL DX

A Low Cost Modified Styrene Resin

POLYMEL DX is not only highly compatible with GR-S, Buna-N and Neoprene but acts as an internal lubricant, plasticizer and effective dispersing agent still enabling the compounded rubber to retain the highest possible physical properties.

One of the functions of this material is to act as a blender of GR-S and natural rubber stocks, not only to afford excellent processing but to aid in linking the rubber molecules as well.

POLYMEL DX will aid the compounder to (1) Reduce milling costs, (2) Detackify highly loaded stocks, (3) Reduce shrinkage, (4) Maintain high physicals, (5) Impart just enough softness to give good calendered gauge control.

POLYMEL DX is truly a versatile material. We invite you to ask for a technical bulletin and a sample.

Prices fob Baltimore		
	1 drum to 4900 lbs.	— .1475¢ lb.
	5000 lbs. to truckloads	— .1425¢ lb.
	Truckloads	— .1375¢ lb.

THE Polymel CORPORATION

MANUFACTURERS OF
compounding ingredients for reinforcing, plasticizing, extending and processing natural and synthetic elastomers.

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CRYSTEX DOESN'T MIGRATE

Do you need a sulfur that won't "bloom" on white or pastel rubber? Stauffer's Crystex* is what you need . . . indeed, it's what you *must* have when you need an almost completely insoluble sulfur. Crystex is exclusive with Stauffer. Crystex fineness and other characteristics are unmatched . . . unduplicated . . . unapproached . . . unique. Crystex is a product of Stauffer Research, developed to meet special needs of the rubber industry. Available for immediate shipment in carloads, truckloads or smaller quantities.

Stauffer

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means service

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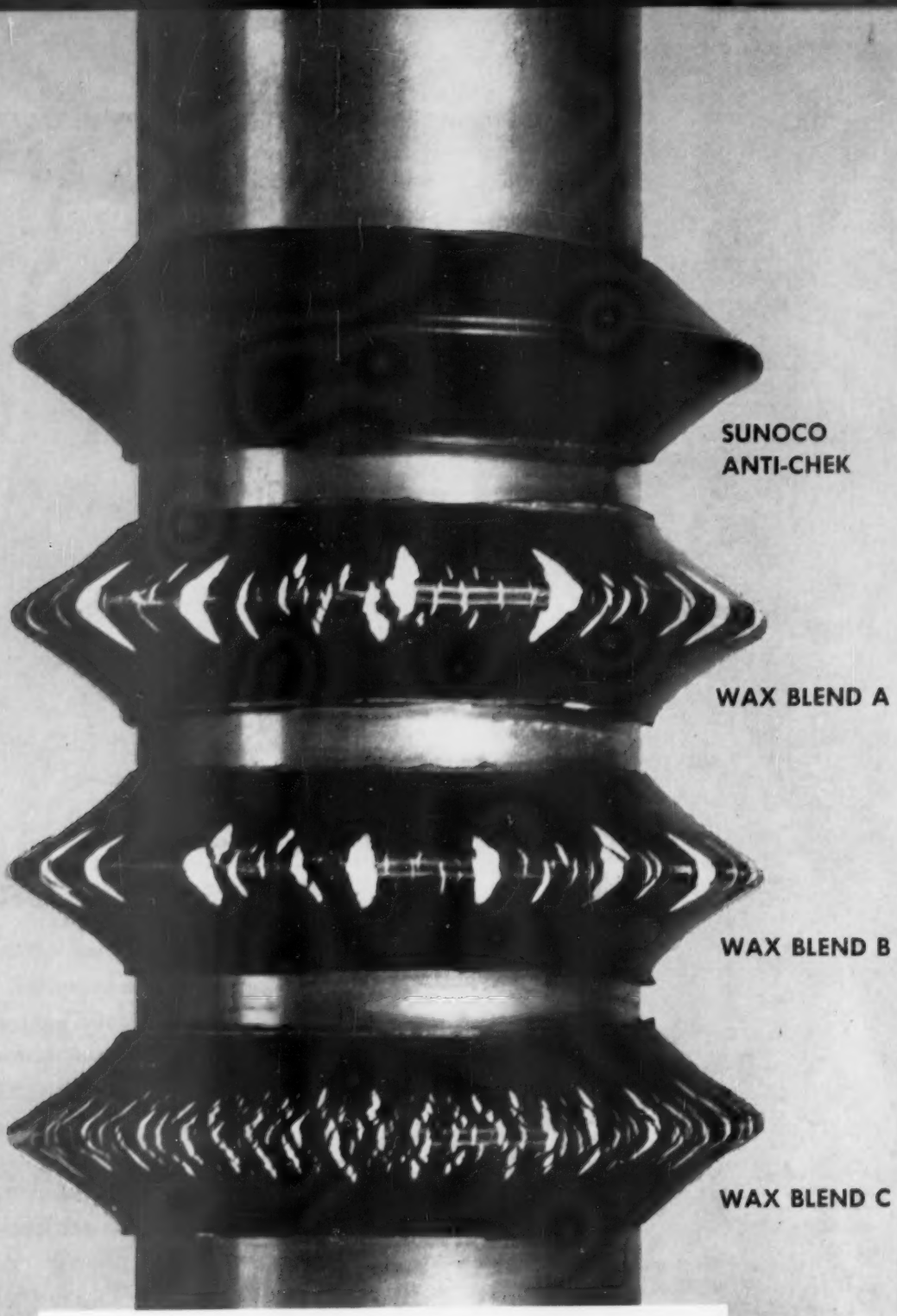
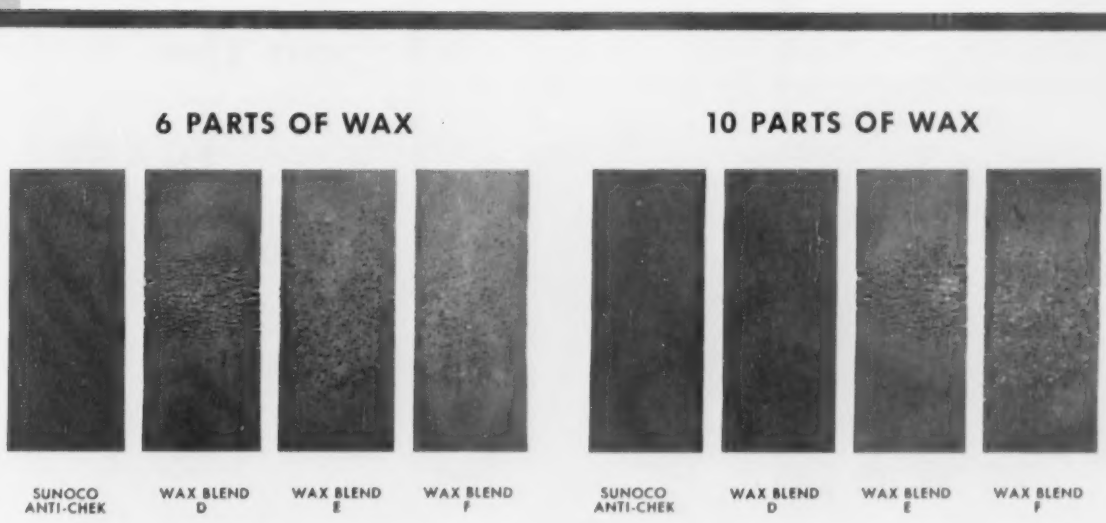


STANDARD A.S.T.M. OZONATOR TEST run for 100 hours proves Sunoco Anti-Chek® superior to ordinary wax blends. These stocks were tested in accordance with the method outlined in A.S.T.M.'s "Method of Test For Accelerated Ozone Cracking of Vulcanized Rubber" (Designation: D 1149-51T). Brushed on talc brings out defects. Note lack of checking and cracking in stock containing Sunoco Anti-Chek. Samples containing ordinary wax blends show varying degrees of deterioration.



LESS SUNOCO ANTI-CHEK NEEDED. These rubber test specimens show that *less* Sunoco Anti-Chek is needed to give *better* protection than you get with ordinary anti-checking wax blends. Ozonator and weathering tests prove that six parts of Sunoco Anti-Chek give equal or better protection than 10 parts of wax blends D, E and F.

Sunoco Anti-Chek Gives More Protection Against Cracking . . . Checking

After rigorous testing, Sun's researchers found that a special wax, Sunoco Anti-Chek, tailor-made for rubber, gave far greater protection than *ordinary* paraffin-microcrystalline blends that form brittle and much-too-thick films.

The rate of bloom determines how long an anti-checking wax protects rubber. Ordinary wax blends bloom too quickly and protection is short-lived. Sunoco Anti-Chek blooms at just the right rate to assure adequate long-life protection. In other words, to get protection for a given time, you need *less* Sunoco Anti-Chek.

For further information on Sunoco Anti-Chek, see your Sun representative or write for Technical Bulletin 30, SUN OIL COMPANY, Philadelphia 3, Pa., Dept. RA-10.

ASK FOR THIS FREE TECHNICAL LITERATURE

- Sun Rubber Process Aids (set of three bulletins describing product qualities of Circosol-2XH, Sundex-41, Sundex-53).
- Sunoco Anti-chek wax: Bulletin 30.
- An Ozonator for Accelerated Testing of Rubber: Bulletin 36.
- A Method for Classifying Oils Used in Oil-Extended Rubbers.

INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY

Philadelphia 3, Pa.

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IN CANADA: SUN OIL COMPANY LIMITED, TORONTO AND MONTREAL

SUNOCO

Fabric helps shield watchful eyes on the "Texas Tower"

From this radar picket station 110 miles out in the Atlantic, land defenses will receive advance warning of approaching aircraft. The "Texas Tower" shelters its sensitive "eyes" in strange-looking balloons called "radomes," capable of withstanding the fiercest gales, yet without blocking the radar's "view." Fabricated by Firestone Tire & Rubber Co., the radomes are made of rubberized nylon actually "supported" by additional interior air pressure. And the nylon fabric, we are proud to say, was engineered for this purpose by Wellington Sears.

Fabrics for such rubberizing applications are only part of the long list provided to all kinds of industry by Wellington Sears over more than a century. Whatever your problem may be, if it involves fabric for coating—or "working" fabrics of any kind, cotton or synthetic—turn to Wellington Sears for able, experienced help.

For informative booklet, "Modern Textiles for Industry," write Dept. G-10

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FIRST In Fabrics For Industry

For Mechanical Goods, Coated Materials, Tires, Footwear and Other Rubber Products

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Lithols . . . Red Lake C's . . .
Clarion Red . . . Bonadur Reds . . . Naphthols . . .

Cyanamid's Pigments Division Offers a Red Pigment for Every Rubber Application

Whatever your requirements in red pigments, one of these efficient Cyanamid pigments can meet them:

LITHOLS and RED LAKE C's . . . for low-cost color strength, brilliance, good working properties.

CLARION RED . . . for bright yellowish shade of superior heat stability and excellent blending potential to provide durable, fast, economical oranges.

BONADUR REDS . . . for superior light fastness and heat stability, combined with non-migration and resistance to bleed in oils.

NAPHTHOLS . . . for high color strength and brilliance, with outstanding resistance to acids, alkalis, soaps and chemical detergents.

Let your Cyanamid Pigments representative help you select the type best suited to your needs.

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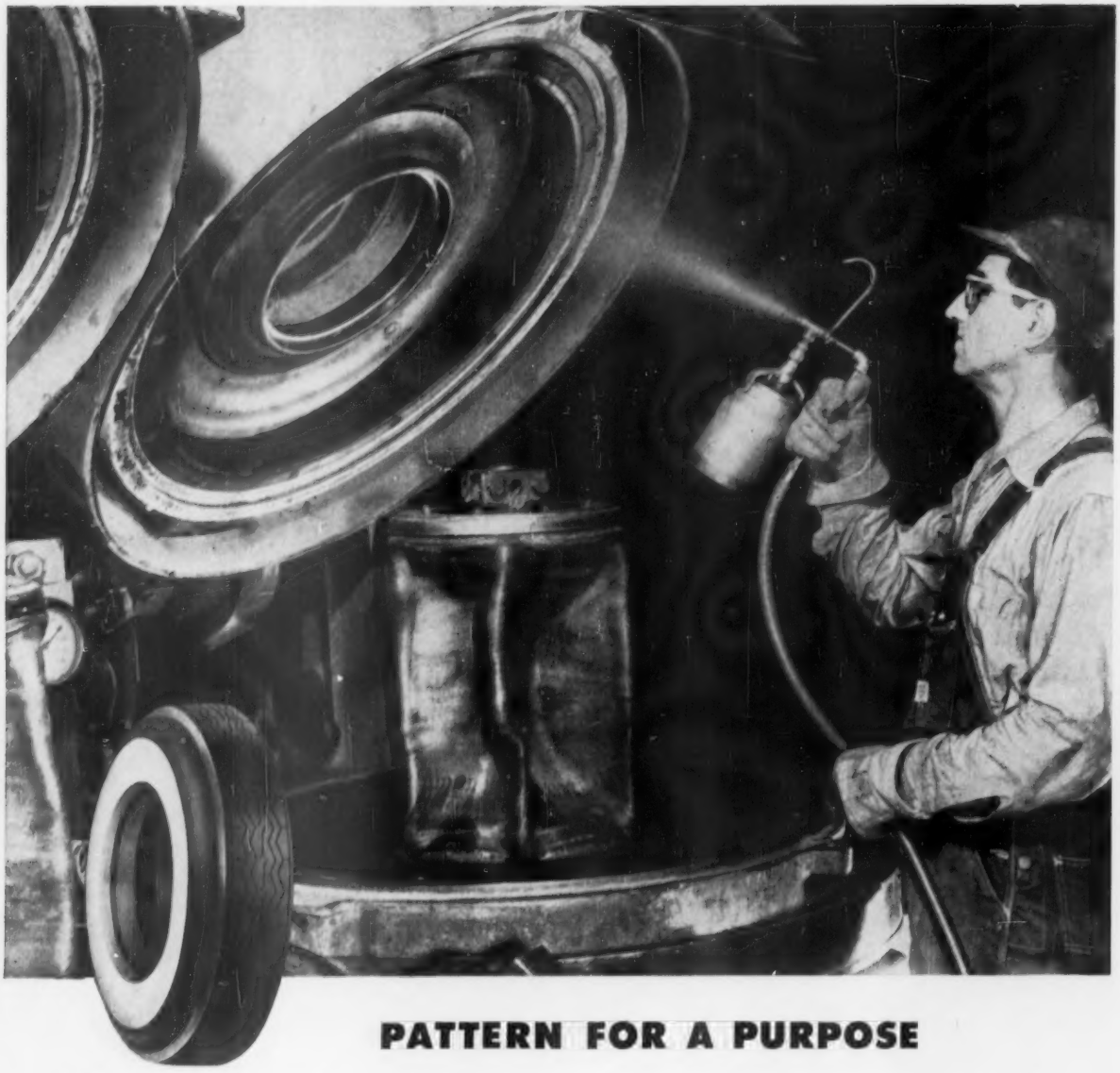
BRANCH OFFICES AND WAREHOUSES IN PRINCIPAL CITIES



PATTERN FOR A PURPOSE

Why one type of tread design, rather than any other? Because it has been calculated to offer the most in road holding with a minimum of wear. There's a precise reason for every tiny slot, every angle . . .

How do you know it's right? Because years of painstaking research by the tire industry are visualized in this pattern . . . a part of the ever-continuing effort to provide safer, surer transportation.

How is it possible to make those thousands of thin grooves? Because with "super slippery" *UNION CARBIDE* silicone release agents, very thin-section molds can be used in standard forming equipment without prohibitive costs.

As reported to us by one manufacturer using silicone release agents for the past eight years: "They reduce blemishes on treads, permit complicated treads not possible without silicones and eliminate mold cleaning."

The SILICONES DIVISION is one of the leading suppliers of silicone release agents for the rubber industry. Find out how these silicones can be adapted to your needs. Contact one of the offices of our distributor The C. P. Hall Co., or write to Silicones Division, Dept. RA-10.

SILICONES DIVISION

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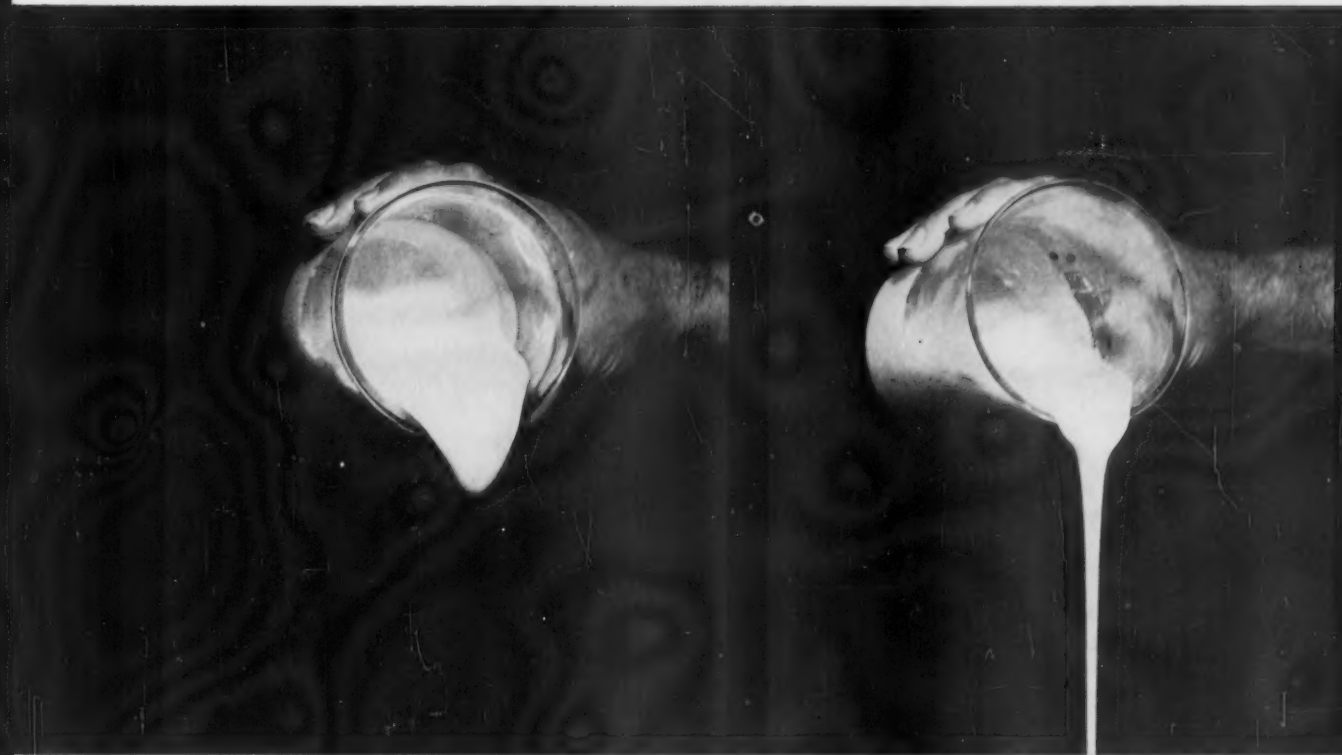
Polymerics in Permanently Plasticized Plastisols?

NEW

CABFLEX® HS-10

for Faster Fluxing Lower Viscosity



Viscosity of Polymeric: 3500 cps. @ 20°C.
SPI Volatility @ 90°C.: 0.69% Loss

Viscosity of Cabflex® HS-10: 378 cps. @ 20°C.
SPI Volatility @ 90°C.: 0.74% Loss

OTHER ADVANTAGES of Cabflex® HS-10 include: Volatility ½ that of di-iso-decyl phthalate; requires no antioxidant; outstanding insulation resistance in electrical vinyl compounds – 13,000 megohms/1000 ft. @ 15.6°C.; excellent resistance to extraction by gasoline, oil and water; low rate of migration; greatly improves processing characteristics while maintaining the permanence of plasticizer systems in blends with polymeric plasticizers. In addition, dry blends of Cabflex® HS-10, unlike those of polymeric plasticizers, are made quickly and easily, resulting in a free-flowing powder.

For free samples and further technical information address

CABOT® PLASTICS CHEMICALS DIVISION

GODFREY L. CABOT, INC. 77 Franklin St., Boston 10, Mass.

for

MORE TURNS PER MOLD
SIMPLER OPERATION
LESS MAINTENANCE

NRM *Autoform* VULCANIZERS

NRM 40" AUTOFORM
TIRE VULCANIZER

2653

NOW MORE EFFICIENT, MORE PRODUCTIVE THAN EVER . . . TIRE CURES PER BLADDER ARE GREATLY INCREASED

NRM Autoform Vulcanizers make bladder assembly and mounting six times faster than with rod type Vulcanizers. When automatically unloaded, they obtain up to 68 turns per mold in 24 hours, and recent developments in method of bladder manipulation assure longer bladder life.

Extremely simple in construction and method of operation, and with no internal hydraulic or other mechanisms exposed to the curing medium, maintenance requirements of the Autoform are at barest minimums. Compactly designed, it requires 15% less floor space than other types of automatic vulcanizers.

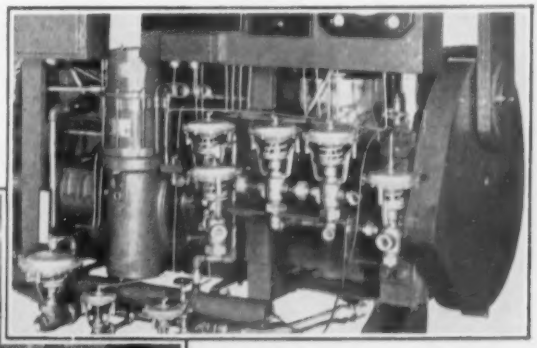
Autoforms are currently available in 40″ dual platen and 45″ and 55″ dual platen and dome types, to handle all passenger and truck tires. Complete with controls and instruments, they are ready to operate when connected to electric, air and steam services. Neither hydraulic nor vacuum service is required. Contact us today. Our Engineers will be happy to work with you.

Fewer Working Parts Mean LONGER LIFE . . . LESS MAINTENANCE

The simple chart below shows the Autoform's bladder simplicity by comparison with rod type presses:

	NRM Autoform	Rod Type
Parts per bladder assembly	3	5
Cap screws per bladder assembly	1	16
Bladder make-up time	2 min. aver.	12 min. aver.
Remove bladder and install another	5 min. aver.	20 min. aver.

The Autoform bladder progressively rolls into the tire, eliminating trapped air. It is peeled from the tire while beads are still on the bead rings, eliminating possibility of kinking the beads.



COMPACT VALVING—with no working parts in the bladder, no hydraulic nor vacuum services, and with only a few valves required for operation, the Autoform is the most economical of all presses to maintain.

SOME OF THE LARGEST TIRE PLANTS IN THE WORLD USE AUTOFORMS for faster, more economical and therefore more **profitable** curing of passenger and truck tires. Field Engineers are available at all times to assist users in obtaining maximum performance from NRM equipment.

2653

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NRM

Creative Engineering

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TITANOX®

You'll never get a wrong number when you use TITANOX—that is, in your line of plastic products.

As whitening, brightening and opacifying agents, nothing can surpass TITANOX titanium pigments for adding eye-appeal to plastics. Titanium Pigment Corporation (subsidiary of National Lead Company), 111 Broadway, New York 6, N. Y.; Atlanta 5; Boston 6; Chicago 3; Cleveland 15; Houston 2; Los Angeles 22; Philadelphia 3; Pittsburgh 12; Portland 14, Ore.; San Francisco 7. In Canada: Canadian Titanium Pigments Limited, Montreal 2; Toronto 1.

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DIPAC

Diisopropyl benzothiazyl–2-sulfenamide

DIPAC* is a new delayed action accelerator designed for modern high temperature processing equipment where maximum freedom from scorch is essential.

	A	B	C
Smoked Sheets	100.00		
ISAF Black	50.00		
Zinc Oxide	5.00		
Stearic Acid	3.00		
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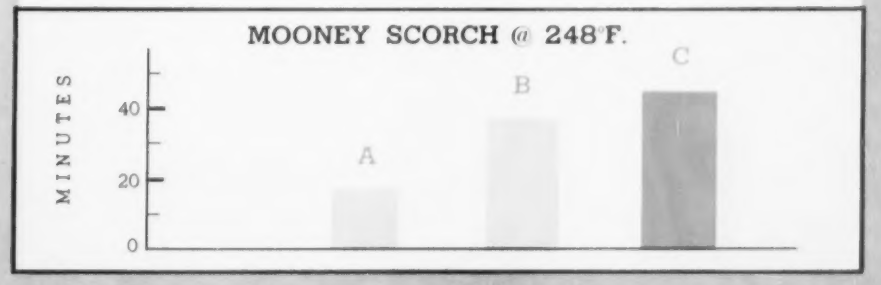

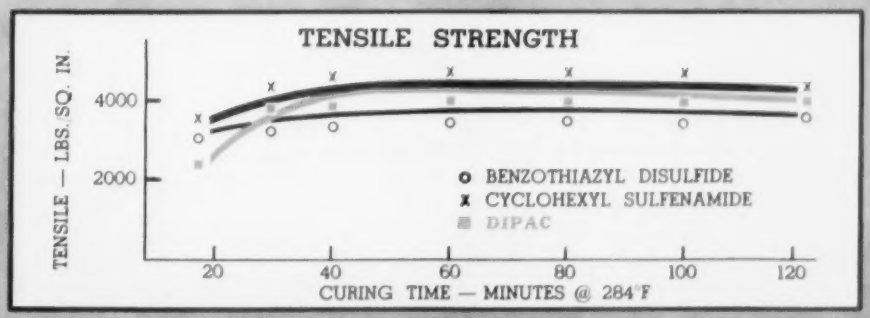

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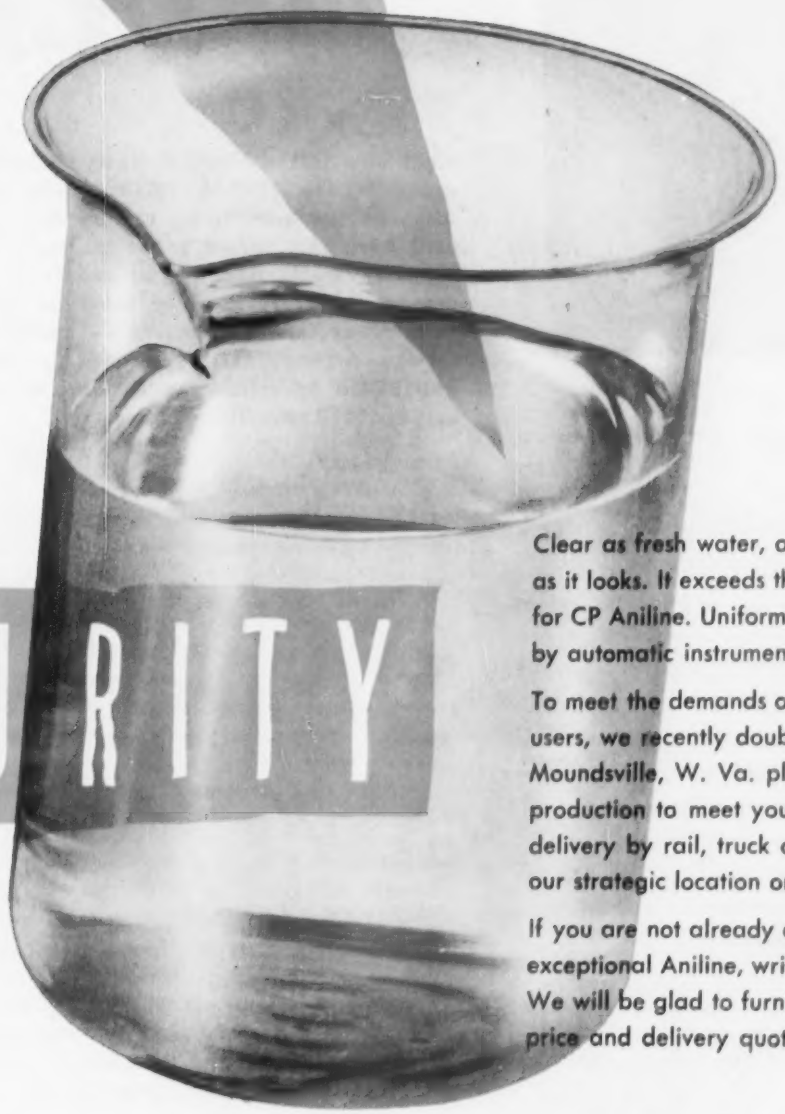

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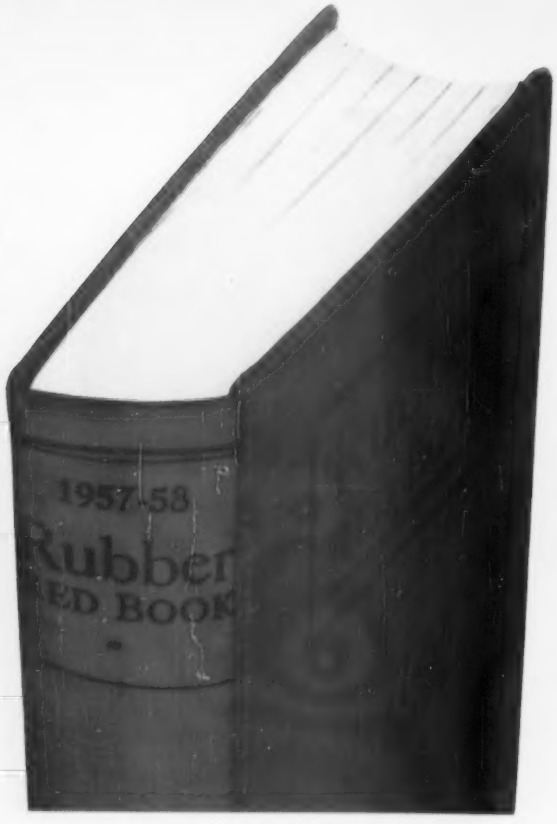

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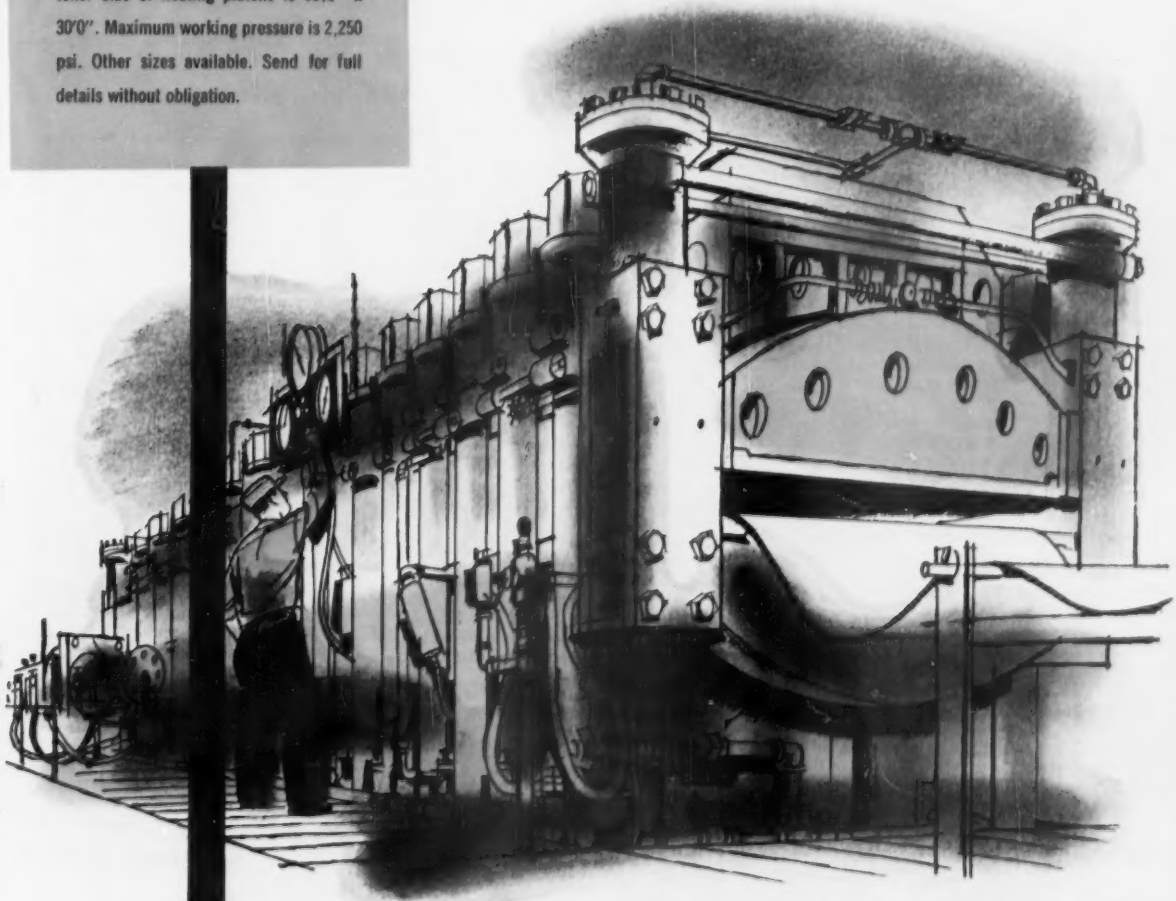

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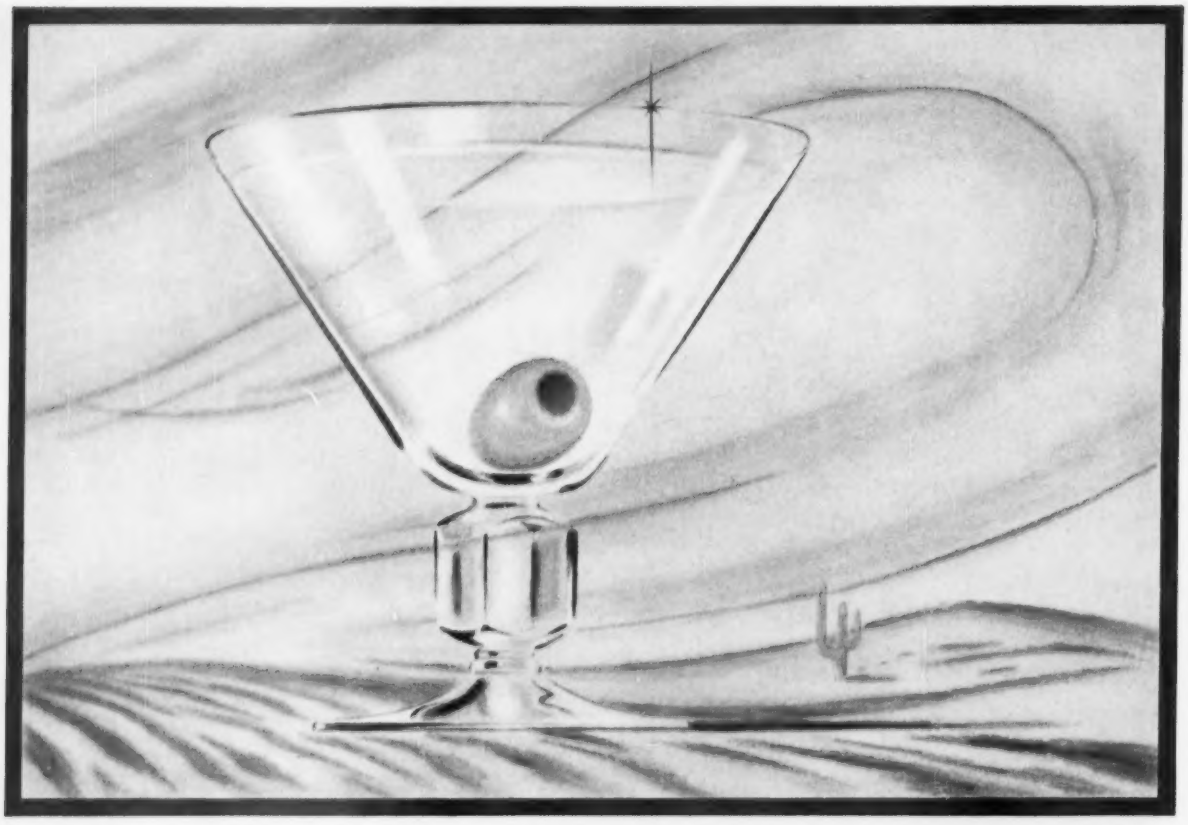

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US RUBBER

Rubber Age

Vol. 80, No. 1 OCTOBER, 1956

Identification of Carbon Blacks by Means of Spectrophotometric Measurements

By A. FIORENZA

Rubber Laboratories, Pirelli, S.p.A., Milan, Italy

CONSIDERABLE importance is attached, both by the manufacturers and the consumers of carbon black, to the recognition of the various types of black used as fillers for rubber compounds. For such recognition, besides the usual determinations of the physical mechanical properties of standard rubber compounds, many other forms of test are used. Foremost among such tests, together with electronic microscope examinations and determinations of adsorption of nitrogen, oil and other substances, there are specific tests for determining the "color" of the black.

The procedures adopted in the past for this last type of test were based on the examination of the carbon blacks in the dry state, either pure or mixed with a white pigment *(1)*, or on the examination of pastes or very concentrated suspensions of the black in oil, with or without a light-colored pigment, by comparison with standard samples *(2)*. Wiegand and Snyder *(3)* in their interesting work in 1933, took up this last process again and perfected it by using a mill for the preparation of the suspensions and a nigrometer for the measurement of the color. With this apparatus they carried out an extensive series of measurements on various types of carbon blacks. In more recent times, other experimenters *(4)* have dealt with this problem, but always using methods based on the examination of carbon blacks as such or pastes of carbon black and oil.

In all of these articles there is no mention made of the application, for the purpose of classification, of a method involving the observation of very dilute carbon black suspensions, with concentrations of the order of 10^{-5} g/cm^3, in benzol or water in the presence of a protective colloid such as natural rubber or gum arabic. These suspensions exhibit a color which varies with the type of carbon black—from brown for the channel blacks to gray for the semi-active furnace blacks and the inactive lamp blacks.

The more diverse color differences can be seen even with the naked eye by direct transparency observations of the suspension. A better classification could be obtained by placing the suspension under examination alongside a series of standard suspensions. These observations are, however, always too rough to distinguish minor differences, especially between the various channel blacks and between the various active furnace blacks, or to make a distinction when a mixture of different carbon blacks is under examination. Accordingly it is considered opportune to give an account of the work carried out in the Pirelli Laboratories on the methods of examining the carbon blacks.

Background of the Investigation

In the period 1930-1940, a system was established of observing suitable diluted solutions of tread rubber compounds in benzene by means of an ultramicroscope and counting the black granules against a dark background

with the object of determining their size and hence differentiating between the various types. These tests, however, were limited in those days to the channel blacks and lamp blacks, together with some thermatomic blacks and some carbon blacks of an experimental character.

But such granulometric examination had limitations, because the optical ultramicroscope cannot observe the number of granules in the chains which exist in almost all the carbon blacks and which determine their structure. Thus, a false evaluation of the elementary granule diameter was obtained. In fact, it gave a value of 70 nm for the channel blacks, whereas the actual mean diameter is 25 nm. Today, the electronic microscope has overcome these limitations. [The symbol nm represents 10^{-9} m, as proposed by CIM (Tab. UNI-CIM 0003)].

Shortly after the second world war, while looking for a classification, using physical constants, of the numerous types of carbon black of diverse nature and origin then available on the market, the examination of suspensions of carbon blacks by means of photometric measurements of absorption in the red and violet bands was undertaken. It was then seen that the inevitable imperfections in the preparation of the suspension made it rather difficult to obtain consistent values for the individual coefficients of absorption.

It was also seen that this difficulty could be overcome by determining the ratio between the coefficients of absorption in the violet and red bands, since these ratios proved considerably more consistent for every quality of carbon black. Further, it was noticed that such ratios could express quantitatively what was said to be the suspension "color", varying between brown and gray, and these ratios were given the name "color indices". The active blacks of the furnace type, which form longer chains than the channel blacks, will give color indices lower than the latter even though the single grain sizes are almost equal.

The present studies were undertaken at the beginning of 1954 with the object of checking the possibility of using the procedure outlined for controlling manufacture. Based on the methods suggested earlier, the carbon black was first incorporated in rubber in small quantities (3 g. of carbon black to 97 g. of rubber) with very careful mixing, and the paste so obtained was dissolved in benzol and repeatedly diluted to obtain the suspension of the carbon black for photometric examination. For the blacks contained in vulcanized rubber compounds, the black was first recovered by destroying the rubber with concentrated nitric acid *(5)* after extraction of the compound with acetone and chloroform.

During the course of the investigation, giving due consideration to procedures tried in the past, it was found that in the case of a carbon black in the free state if sufficiently small quantities are used it is not necessary to make a preliminary suspension of the carbon black in rubber; instead, it is sufficient to disperse the carbon black directly in water in the presence of gum arabic. Where non-vulcanized rubber compounds are concerned, the compound need only be dispersed in a benzene solution of rubber. In the case of vulcanized compounds, it is unnecessary to destroy the rubber with nitric acid or other dissolving media, since the rubber can be disintegrated by suitable heat treatment in the presence of a volatile solvent, then proceeding as for the crude compound.

With the preparations described above, and using the method outlined in this article, it is possible to secure a definite determination and identification of carbon black even if there is only a very small quantity of carbon black or rubber compound available. It should also be pointed out that the time required for carbon blacks in the free state and for the crude compounds is slightly more than half an hour, whereas the vulcanized compounds take a little over three hours.

Principle of Measurement

The principle of the optical measurements taken on the suspensions of the carbon blacks is that of measuring the variations which the radiant energy undergoes when an absorbent medium is interposed in the path of the light rays.

The general law which defines the absorption phenomena is that of Lambert-Beer, namely:

$$I = I_o \cdot 10^{-K(\lambda) \cdot c \cdot s}$$

where I_o = the intensity of the incident light,
I = the intensity of the transmitted light,
$K(\lambda)$ = a constant which depends only on the wave length and the type of substance under examination,
c = the concentration of the solution, and
s = the distance travelled by the light rays through the solution, i.e., the thickness of the solution.

Converting into logarithms, we have

$$K(\lambda) \cdot c \cdot s = \text{Log} \frac{I_o}{I}$$

By means of spectrophotometers, which basically consist of a source of monochromatic light, a vessel containing the medium whose absorption power is to be determined, and a calibrated photometric receiver, it is possible to determine the magnitude of what is usually called "transmittance"

$$T = \frac{I}{I_o}$$

on a linear scale, or the "absorption"

$$A = \text{Log} \frac{I_o}{I}$$

on a logarithmic scale. Both these scales usually appear on photometers.

Thus, knowing the concentration of the solution under examination and its thickness, the value of $K(\lambda)$ (coefficient of absorption) can be calculated for every wave length. This is given by

$$K(\lambda) = \frac{1}{cs} \text{Log} \frac{I_o}{I}.$$

The value of $K(\lambda)$ depends on the units used to express the concentrations and the thickness of the solution. Generally, s is expressed in cm and c in mols/litre, while in the case of suspensions of carbon black, it is necessary to express the concentration in g/cm³. In this way, $K(\lambda)$ expresses the absorption relative to the unit of thickness and the unit of concentration of the suspension. By plotting the values of $K(\lambda)$ as a function of the wave length, the characteristic absorption spectrum of the substance under examination is obtained.

In the case of suspensions of the carbon blacks, the spectra are generally formed of slightly rising curves of small curvature. For simplicity of method and for reasons already stated above, the color index has been

assumed as the ratio between the absorption coefficients K(430) and K(750), corresponding to the wave lengths 430 and 750 nm, and is thus given by

$$I_c = \frac{K(430)}{K(750)}$$

The color index can be easily calculated from the value of $K(\lambda)$ by determining the ratios of the absorptions. This is done in practice by considering the ratios of the readings taken on the logarithmic scale of the spectrophotometer.

Methods of Dispersion

Manual Dispersion between Glass Plates: This method is carried out by using two optically ground glass plates (photographic plate type) to induce strong velocity gradients in the suspension between them and in such a manner as to spread the friction uniformly over the entire surface. This is achieved by holding one glass in each hand and carefully rubbing the upper glass on the lower one.

This method, though having the advantages of simplicity and requiring only very modest apparatus, depends on the manual ability of the operator in that it can give truly excellent results only if carried out by an expert. It also has some inconveniences due to various factors, such as the difficulty of finding sufficiently flat glass plates, the ease with which the glass plates are scratched, and the possibility of not totally dispersing the carbon black, due to some of it being squeezed over the edge of the plates and escaping the rubbing action.

Mechanical Dispersion with a Mill: For reasons given above, a procedure of dispersion using a mechanically-operated device has also been studied. It seemed that the most suitable system was that based on the principle of a ball mill. The model that has been constructed (Figure 1) is of the very simplest design and has some novel features. It consists of a small stainless steel vessel in the form of a cup containing a steel ball of the type used for ball bearings. The internal curvature of the sides of the cup is the same as the curvature of the ball, so that when the mill revolves on its horizontal axis the rolling ball mainly adheres to the internal peripheral surface of the cup.

The speed of rotation of the mill must not be too high, since the ball must turn on its own axis without being dragged into rotating with the cup. On the other hand, the speed of rotation must not be too low, or this would prolong the time of grinding. The optimum speed, determined by means of tests, is from 250 to 300 revolutions per minute.

In order to assist the grinding efficiency, a magnet or an electro-magnet is placed under the rotating mill. The ball, being of carbon steel and magnetic, is attracted, while the mill, which is made of austenic steel, does not affect the magnetic field. Thus, the pressure exerted by the ball on the carbon black in the mill is increased; such pressure, in the absence of a magnet, would only be due to the weight of the ball. This device does not improve the final dispersion of the black, which would be good even without a magnet, but it decreases the milling time from two hours to about one hour.

To prevent the evaporation of the gum arabic solution, necessary for the dispersion of the black, the mill is closed with a polyethylene plug, in which there is a small hole through which the air can enter when the plug is removed.

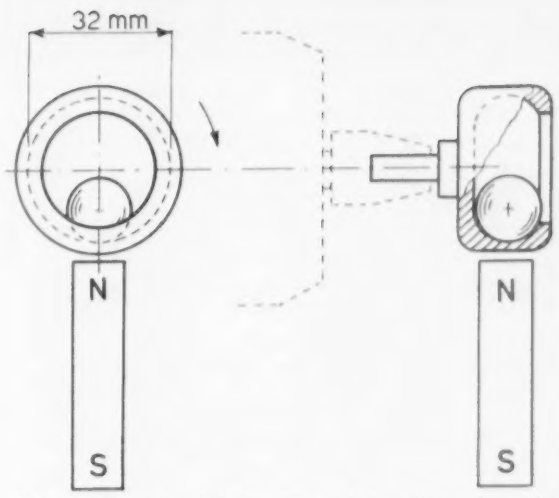

FIG. 1—Sketch of ball mill used for dispersion of the black.

This system, which has been used up till now only for the blacks in the free state but which, with suitable modifications, could also be used for the carbon blacks contained in crude or vulcanized compounds, is completely independent of the operator for the dispersion of the carbon blacks. However, it does not give a better dispersion than that obtainable with the "between glass plates" method; on the contrary, if the "between glass plates" method is carried out with particular skill, it can yield superior qualitative suspensions. The method of dispersion in a mill is probably better adapted to the work of production control, while the "between glass plates" method is of greater use for research and laboratory work, provided that specialized personnel is available.

Preparation of the Dispersions

Free Carbon Blacks (Manual Dispersion): 1 mg of carbon black is weighed on a 10 mg capacity torsion balance to an accuracy of $\pm$ 0.01 mg and then placed on a photographic type glass plate, and, after moistening the black with some drops of 20% aqueous solution of gum arabic, the same procedure is followed as already explained. The dispersion can be assisted, if necessary, by adding a few drops of water and checked by placing a sheet of white paper under the glass plates. When the dispersion is completed, the entire quantity of the dispersion is carefully washed off the glass plates into a 100 cm^3 calibrated flask with the aid of an air brush and funnel and the volume made up by the addition of water.

Free Carbon Blacks (Mechanical Dispersion): 1 ± 0.01 mg of carbon black is weighed on a torsion balance and put into the mill, taking care that it falls on the peripheral section where the ball will roll. The carbon black is moistened with 3 drops of 20% gum arabic solution. Then, keeping the mill horizontal, the steel ball is introduced. By means of a motor and a suitable system of speed reduction, the mill is rotated for one hour at 250 to 300 rpm under the conditions described above. Without removing the ball, the mill is repeatedly washed with distilled water from a wash bottle and the dispersion is collected in a 100 cm^3 graduated flask, over which a funnel has been placed to facilitate the collection of the liquid. In order to more completely remove the carbon black from the mill, during the washing operations the mill is

TABLE I—COLOR INDEX OF THE PRINCIPLE BLACKS OF VARIOUS TYPES CURRENTLY COMMERCIALLY AVAILABLE

Type of black		Supplier	Color Index
MT	—Medium thermal	A	1.03
	Lamp black	B	1.05
FT	—Fine thermal	C	1.12
SRF	—Semi-reinforcing furnace	D	1.15
MAF	—Medium abrasion furnace	E	1.17
FEF	—Fast extruding furnace	F	1.21
HMF	—High modulus furnace	E	1.27
	Acetylene black	G	1.30
FF	—Fine furnace	E	1.37
HAF	—High abrasion furnace	A	1.41
HAF	—High abrasion furnace	F	1.46
	Acetylene black	H	1.48
CF	—Conductive furnace	A	1.52
ISAF	—Intermediate super abrasion furnace	A	1.53
SAF	—Super abrasion furnace	F	1.65
	Anthracene black	I	1.65
EPC	—Easy Processing channel	D	1.68
MPC	—Medium Processing channel	D	1.74
HPC	—Hard Processing channel	D	1.80

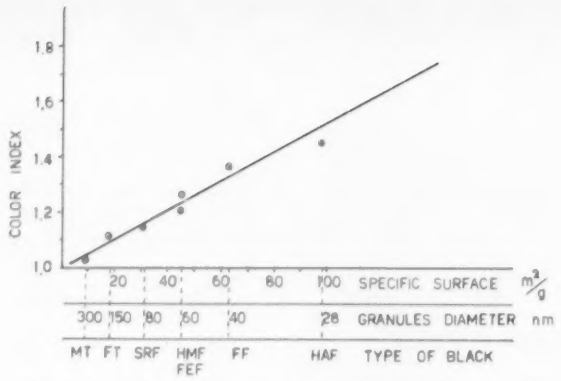

FIG. 2—Color index as a function of the granule diameter and specific surface area of thermal and furnace blacks.

rotated by hand about its axis so that the ball rolls slowly. In this way the entire quantity of the carbon black comes away from the mill. Water is added in the flask to make up the volume.

Carbon Blacks Contained in Crude Rubber Compounds: On a torsion balance, a quantity of rubber compound corresponding to 1 ± 0.01 mg of carbon black is weighed and the procedure adopted as for carbon blacks in a free state, using the method of dispersion between glass plates and benzene instead of the gum arabic solution. However, as the benzol tends to evaporate rapidly, the work is facilitated by the addition of 2 or 3 drops of paraffin oil. For washing the resultant dispersion from the glass plates, a 1% benzolic solution of first latex crepe rubber is used. In this case, the carbon black is generally already well dispersed in rubber; therefore, it is only necessary to obtain a total solution of the compound. The addition of the rubber solution avoids any flocculation of the carbon black in an overdiluted solution, which might occur if the rubber compound were simply dissolved in the solvent.

Carbon Blacks Contained in Vulcanized Rubber Compounds: A quantity of vulcanized rubber compound corresponding to 1 ± 0.01 mg of carbon black is weighed as for crude compounds and placed on a small watch glass with 8 to 10 drops of paraffin oil. The glass and contents are then put into an oven at a temperature of 180° C. for about two hours. In this way the vulcanized rubber is completely disintegrated, leaving the carbon black free. Using a small quantity of benzene, the entire mass is transferred onto a photographic type glass plate. Then the same procedure is used as for crude rubber compounds. This method is good for natural, butadiene-styrene and butyl rubber.

Spectrophotometer Readings

The determinations of the coefficients of absorption for 430 nm (violet) and 750 nm (red) can be made with an optical photometer provided with suitable filters, or better, as has been done in the execution of the present work, with a cell type spectrophotometer provided with a monochromator, using as a control (blank) water for aqueous suspensions and a 1% solution of first latex crepe rubber for the suspensions in benzene. It should be emphasized that the best results are always obtained by using a highly sensitive apparatus, which offers ease of calibration and of checking measurements, and which functions, as far as possible, independently of the human element.

Applications of the Procedure

The methods described still have some imperfections, which it is expected will be eliminated, or at least decreased, by developing the study of the dilute dispersions

TABLE II—COLOR INDICES OF BLACKS FROM VARIOUS SUPPLIERS AND DIFFERENT BATCHES

Type of black	Supplier	Date of arrival of batch (Year 1954)	Color index
	L	January 27	1.10
		April 14	1.11
		April 24	1.09
		May 29	1.09
SRF—	E	January 27	1.08
Semi-reinforcing furnace	D	April 24	1.15
		May 29	1.16
		December 29	1.15
	M	March 4	1.15
		May 29	1.16
	A	January 27	1.42
		February 19	1.43
		April 24	1.45
		June 30	1.45
		July 29	1.44
HAF—		July 30	1.44
High abrasion furnace		December 29	1.44
	L	February 11	1.44
		December 11	1.46
		December 29	1.42
	N	February 16	1.75
		February 27	1.74
		July 8	1.74
		August 7	1.76
MPC—		August 27	1.74
Medium Processing channel	O	January 27	1.74
		May 8	1.75
		June 30	1.74
		December 29	1.76
	D	May 27	1.75

TABLE III—COLOR INDICES OF BINARY MIXTURES OF MPC, HAF AND SRF BLACKS

MPC	Color index	HAF	Color index	SRF	Color index	MPC
100%	1.73	0%	1.16	100%	1.16	0%
90%	1.71	10%	1.19	90%	1.24	10%
80%	1.68	20%	...	80%	...	20%
70%	1.64	30%	1.25	70%	1.35	30%
60%	...	40%	...	60%	...	40%
50%	1.59	50%	1.29	50%	1.49	50%
40%	...	60%	...	40%	...	60%
30%	1.52	70%	1.35	30%	1.59	70%
20%	...	80%	1.38	20%	1.64	80%
10%	1.46	90%	1.41	10%	1.68	90%
0%	1.43	100%	1.43	0%	1.73	100%

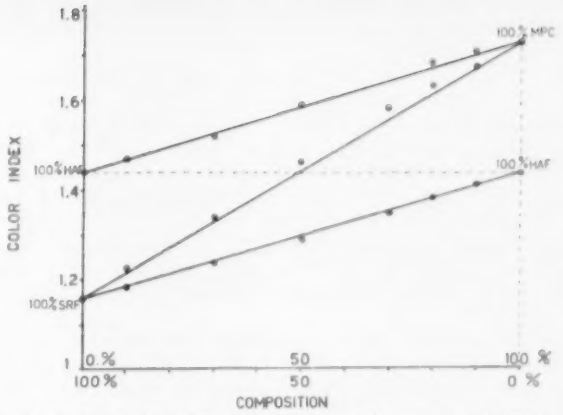

FIG. 3—Color index of binary mixtures of MPC, HAF and SRF blacks.

of carbon black. But none the less, these methods have enabled some success to be attained in the problem of recognition of the carbon blacks, both in the free state and dispersed in crude or vulcanized rubber compounds. More recently, such methods have been used to resolve various problems, of which some examples are given below.

Classification of the Various Types of Carbon Blacks: A classification has been made of the principal carbon blacks of the various types commercially available so as to have an adequate picture of the color indices representing the existing wide range (Table I). A definite correlation exists between the color indices so determined and the specific surface areas and diameters of the elementary granules of some thermal and furnace blacks previously mentioned in the literature (*6*). This correlation is shown in Figure 2.

Differences Present between Carbon Blacks of the Same Type: Actual differences have been determined between carbon blacks of the same type from different manufacturers and between carbon blacks of different batches from the same manufacturer. The values of the color indices in three series—each of ten carbon blacks and belonging to the types SRF, HAF and MPC—are tabulated in Table II. The color indices vary between relatively restricted limits for the HAF and MPC types. In the case of the SRF blacks, the variations are also relatively small between different batches from the same manufacturer, while marked differences occur between those from different manufacturers. In fact, the ten SRF blacks examined can be divided into two groups, viz., those with an average color index of about 1.15 from manufacturers D and M, and those with an average color index of about 1.10 from manufacturers C and E.

Composition of Mixtures of Carbon Blacks: Knowing the color index of the components, the composition of binary mixtures of diverse types of carbon blacks has been determined. The study was made on three types of carbon (MPC, HAF and SRF) and the following binary mixtures were examined: MPC-HAF, HAF-SRF and SRF-MPC.

The values obtained (Table III and Figure 3) are the average of five determinations in which the maximum deviation of the color index is of the order of ± 0.01. The color index is therefore a linear function of the composition of the mixtures, and from this it is thus possible to very quickly arrive at the composition of the mixtures, provided a quantity, even very small, of the two carbon black components is available in order to obtain a preliminary calibration. The calibration, besides being very rapid, is always necessary due to the need to take into account the variability of the color index for the same nominal type of carbon black and the casual variations in the means adopted for the preparation of the suspensions and for the relative photometric readings. It is noted that the same results can be obtained with a large number of more or less complex combinations. For example, the same color index can be obtained by mixing in varying percentages an MPC black with an HAF black or with an SRF black. In fact, the same color index (1.59) is given by mixtures of 50% MPC-50% HAF and 30% SRF-70% MPC (see Table III). The same index could also be obtained for only one carbon black having intermediate characteristics.

Production Control: Production control has been carried out during the manufacture of rubber compounds on the blacks and on both half-finished and finished products. The accompanying histogram or frequency distribution diagram (Figure 4) covers a large series of manufacturing tests conducted on samples of MPC black, all sampling being done during production. These tests were

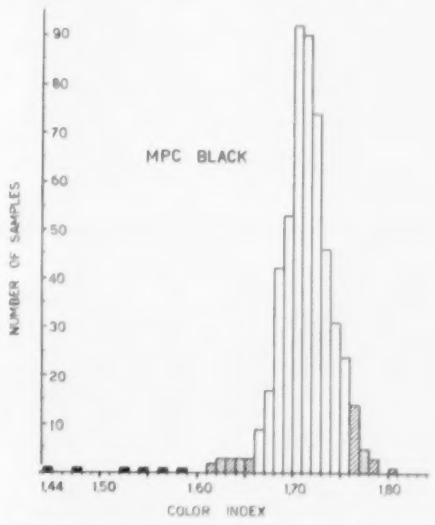

FIG. 4—Frequency distribution diagram covering a systematic check of a phase of processing.

made for the purpose of bringing to light any defects in the functioning of the production equipment which could thus be corrected.

It is to be noted that in the diagrams the frequency values are shown in three different ways, viz., with a white column, those which have been considered normal, taking into consideration the variability between suppliers, between batches and also the possibility of slight impurities permitted in production; with a hatched column, those which are already outside the tolerated limits, and with a black column, those corresponding to definitely abnormal samples. Numerous other tests have been made on other carbon blacks and crude and vulcanized rubber compounds.

The results of the color index determination can be integrated with the results of other tests, such as microscopic examinations (which above all enable the recognition of mixtures of microscopic carbon blacks with ultra-microscopic carbon blacks), and, in the case of carbon black powder, the examination under fluorescent light of the benzene extracts of these carbon blacks, which enables a distinction to be made, in case they have equal color indices, between the carbon blacks which give such fluorescence and those which do not.

Summary

The determination of the "color" of the blacks used as fillers for rubber compounds is of considerable importance since this color depends not only on the fineness of the blacks but also on their structure characteristics, which in turn are a consequence of the manufacturing process and of the raw materials used.

The determination is normally carried out by the examination of the dry blacks or of very concentrated pastes of black in oil, with or without a white pigment, for comparison with reference samples. It does not appear that the observation of very diluted dispersions of the black, at concentrations of the order of 10^{-5} g/cm³ in benzene or in water and in the presence of a protective colloid such as natural rubber or gum arabic, has ever been considered in the technical literature.

In the present experiments these dispersions, the color of which varies according to the type of black used, were studied by spectrophotometric measurements of the absorptions in the violet and red regions, their ratio, which has been called the "color index", being of particular significance.

The method for applying the test on extremely small quantities of black, free or dispersed in crude or vulcanized rubber compounds, has been indicated.

Analysis of the results obtained in these experiments has shown that a certain relation exists between the diameter of the granules and the color index of diluted dispersions and that the determination of the latter gives a solution to various problems, such as control of the differences existing among blacks of the same type but coming from different suppliers and lots, determination of the percent composition of binary mixtures of blacks of different types, and rapid control of the factory processes.

Conclusion

The study of some particular optical properties of dilute suspensions of carbon blacks has been started with the present work, and thus a new, practical and rapid means of investigation has been placed at the disposal of the researcher. This may be aligned and used with other methods already established.

The color index, determined as described in the present work, can in fact be an excellent means of recognizing the various types of carbon black, since it is almost independent of any differences in the execution of the test, whereas such differences are a definite negative property of the examinations of oil pastes. Besides, the color index method can be used for very small quantities of carbon black, either in the free state or in crude or vulcanized rubber compounds. This last fact represents another advantageous point in respect to the methods which use oil pastes and can only be applied to carbon blacks in the free state.

The photometric study of the dilute suspensions of carbon black is still in the early stages and thus requires a more thorough treatment both in connection with the technique of preparing the suspensions and their spectrophotometric examination.

It is proposed to continue this study, combining it with the use of other techniques and with research methods of a different nature.

ACKNOWLEDGMENT

The author wishes to thank Dr. S. Oberto, to whom is due the principle of the procedure indicated above, and who has also freely given his advice during the course of the experimental work.

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The Bishman Manufacturing Co., Osseo, Minn., has announced the development of a rim protective compound for tubeless tires. Called **E-Z Off Rim Compound,** the material is said to be a specially designed compound that prevents rust and serves to lubricate the rim for mounting a tire. The material is available in quart, gallon and five gallon containers.

A new analytical instrument that is said to be ideal for fluorescent analysis and identification of compounds in solution throughout the visible and ultraviolet regions has been introduced by the American Instrument Co., Silver Spring, Md. Called the **Aminco-Bowman Spectrophotofluorometer,** the instrument features a range of 200 to 800 millimicrons and requires no special skill in operating it.

An improved waterproofing material that is said to set in five minutes or less and bond to concrete or other masonry walls or floors, has been announced by Maintenance Engineering Co., 16 W. Johnson St., Philadelphia 44, Penna. It is said that the material, called **Meco Sealtite,** can be used to waterproof reservoirs, tanks, and other similar types of structures.

Process for Forming Chempruf Fluorothene Film and Sheet

THE use of low-cost, corrodible metals to handle highly corrosive chemicals has been made economically feasible by the development of a new type of cladding material based on Bakelite fluorothene resins. The new cladding makes it possible to combine the chemical and heat resistance of fluorothene with the structural strength and low-cost of metal pipe.

Fluorothene plastic has demonstrated extraordinary resistance to corrosion by the most active chemicals and offers excellent solvent resistance. Its main problem, up to now, has been how to transfer this excellent chemical resistance to the surface of pipe, hose, ducts and tanks that have to withstand the bite of acids, alkalies and powerful oxidizing agents.

New Process Developed

Armen, Incorporated, of Long Island City, N. Y., has come up with an answer via a new process which turns out fluorothene film and sheet without using plasticizers or lubricants. The Armen process for forming this Chempruf film and sheet does not impair the exceptional properties of fluorothene, according to the manufacturer. Besides its amazing chemical inertness, Bakelite fluorothene is tough, and can resist temperatures as high as 390° F.

The development of the new fluorothene cladding is of special value to the chemical process industries which handle strong oxidizing agents. Wherever corrosive chemicals are used, as in the production of dyestuffs, paper and pulp, pharmaceuticals, antibiotics, industrial acids and alkalies, the new cladding offers an economical means to prolong the life of equipment.

Very few things will stick to the inert surface of fluorothene. Consequently, there is little danger of deposits forming on the inside of pipes or tanks clad with the new material. Even beer stone, which is a hard deposit that bedevils brewers because it constantly forms inside their equipment and clogs it, does not cling to this cladding. The surface smoothness of fluorothene cladding also plays a part in maintaining its anti-adhesive character. Even seams joining two sections of the new cladding can be made mirror smooth by relatively new processes.

To bond this anti-adhesive material to the inside of metal pipe or to line tanks, it is supplied with a felt-like surface on one side which is made of asbestos or asbestos-glass. The over-all thickness of this material recommended for rigorous usage is about .03 of an inch of which about .02 of an inch is plastic. The same thickness may be used to line pipe with diameters ranging from a fraction of an inch up to any number of feet. Such cladding tubes are furnished in any desired length, with or without flanges, depending on miscellaneous plans now projected.

Features Unusual Properties

Unlike corrosion-resistant ceramic coatings, Chempruf cladding is tough and flexible. Neither impact nor abrasion will cause it to shatter. The tubular sleeves are easily inserted into pipe since this flexible material allows the tubes to be collapsed. Heat and pressure applied inside the tube then force it against the walls of the pipe where it is adhered with the aid of the fibrous backing.

New Machine Tests Elasticity of Rubber at 800 F.

RESEARCH scientists of the Firestone Tire & Rubber Co., Akron, Ohio, have developed an electrically-powered machine that tests the strength and elasticity of rubbers up to 800° F. temperatures. Controlled from the outside, the tester can maintain constant interior temperatures that are scientifically accurate. The new machine is being used in the quest for new synthetic rubbers that will be capable of performing satisfactorily at temperatures that presently burn or melt most rubber products. These new heat-resistant rubbers are needed for high-speed aircraft and missiles, high-speed tires, and industrial rubber products for high-speed machinery.

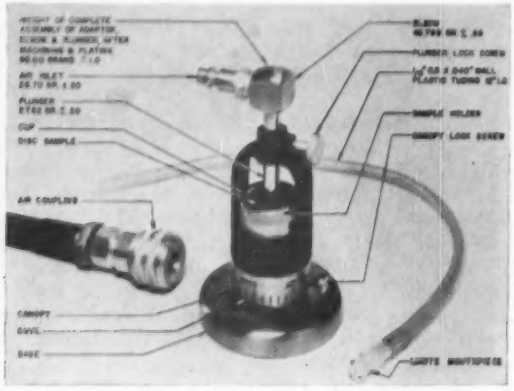
The tester, occupying about as much space as a home furnace but using more power per month than 25 average-size houses, is enclosed in an insulated chamber that is heated by 14 electric units which use 15,000 watts. The chamber has a transparent window, constructed with five layers of regular plate glass, for the visual inspection of tests.

Present published data on rubbers go no higher than 400° F. The new machine is capable of use up to 1000° F. During its early trials, the new unit has been operated at 800° F., the temperature of an airplane's surface when traveling 2,200 miles an hour through —67° F. air.

Electrically-heated chamber developed by Firestone research scientists.

Precision Rubber Sealing Test Jig

A rubber pressure sealing test jig, designed for the evaluation of the sealing properties (zero sealing point, initial sealing pressure and conditioned sealing pressure) of rubber and rubberlike materials by ASTM Test Method D-1081, has been announced by the Precision Scientific Co., 3737 W. Cortland St., Chicago 47, Ill. Ac-



cording to the company, the test jig can also be used to simulate service behavior of rubber used for hatches, airports and watertight and airtight door gaskets according to MIL-R-900A. All critical parts of the device are said to be precision machined from brass and stainless steel. An adjustable canopy, with an easy-to-read scale in units of 0.001 inch, permits accurate vertical adjustment of the plunger to 0.0005 inch.

Scott Spruance Clamps

Improved tensile testing of tire cords by means of "Spruance Clamps" has been announced by Scott Testers, Inc., 85 Blackstone St., Providence, R. I. The clamps are designed for use on the company's IP-4 tensile tester. Operation is as follows: (1) Clamps

are pneumatically actuated by foot control. (2) One-hand action inserts the specimen. (3) The foot switch actuates the following automatic sequence: (a) fixed clamp closes; (b) specimen is straightened to the point of initial tension without strain; (c) moving clamp closes; (d) test proceeds. (4) After break, both clamps open simultaneously and broken ends clear away. The unit is said to have such advantages as automatic adjustment of the clamps which compensates for varying cord diameters; uniform pressure upon cord assures no crushing or slippage; twist is not disturbed, and uniform tension is assured. In addition, the new clamping system, as integrated into the company's Tensilgraph, permits much faster production testing. According to the company, the standard IP-4 Incline-plane Tensilgraph may be ordered with this feature, or it can be applied to existing IP-4 Tensilgraphs by shipping them either to the Providence factory or to Scott Testers (Southern), Inc., Spartenburg, South Carolina.

Appearance-Retention Tester

A new apparatus for testing the appearance and wear qualities of knitted and woven fabrics, as well as rubber and plastic films and coatings, has been announced by Fabric Development Tests, P.O. Box 45, Brooklyn 32, N.Y. Called the Appearance-Retention Tester, the unit is used in such development and control tests as pilling, surface wear and abrasion. In operation, the tester employs samples and a specified abradant which are die cut to give disks 4.5 inches in diameter. The abradant is mounted face up in the abradant holder. The abradant

follows a uniform circular path with a displacement of 1.5 inches in diameter. The sample is mounted on the sample holder quickly and without tension through the use of a special mounting cone. The sample holder, with the fabric surface to be tested facing down, is slipped up on the lower part of the head. The head is free to move up and down but does not rotate. A suitable weight is placed on the head which is then lowered until the test area of the sample contacts the abradant. A timer is set and actuated to carry out the test. Both wet and dry tests can be run. The results are then evaluated as required.

A. Schrader's Son Division, Scovill Manufacturing Co., Inc., 470 Vanderbilt Ave., Brooklyn 38, N. Y. has announced the development of a new **Eze-Mount Snap-In Tubeless Tire Valve.** This new valve is specially designed and shaped for easy insertion into round rim holes. A large hole in the valve base and the tapered, rounded bottom of the metal insert is said to provide a ball and socket action to permit flexibility of the valve stem which prevents accidental disturbance of the valve base.

Matching of Colors in Elastomers

By A. J. NORTHAM

Assistant Sales Manager, Rubber Chemicals, Elastomers Division, Organic Chemicals Department, E. I. du Pont de Nemours & Co., Wilmington, Delaware

THE art of coloring rubber to enhance eye appeal and trade acceptance has been practiced for many years and the use of color represents a sizeable and growing market. There are, however, limitations in coloring rubber that are due to the rubber itself and not to the colorant. Rubber, whether natural or synthetic, has a fundamental color of its own, usually of a brownish tone. This affects the colorant added and must be reckoned with in all color matching work. Some items originally made of rubber have actually lost their position to plastics, because many plastics lack inherent color and hence exert little or no shading effect on the added colorant. As a result, more attractive colors and finishes can be obtained. Elastomeric products can be colored attractively and finished to simulate items ranging from leather to plastics in appearance.

The matching of colors in rubber goods is still an art the success of which depends primarily on the experience of the compounder or colorist. Fortunately, almost anyone who does not have defective eyesight, such as color blindness, can learn in a short time to match colors successfully. The human eye is still the most sensitive instrument in detecting variations in color; the normal eye can detect about 2,000,000 variations in shades, tints and hues.

Fundamentals of Color

As this article is essentially for beginners in color matching, a review of some of the fundamentals pertaining to color should be helpful. Let us first try to explain color from a physical point of view. In our study of physics we learn that light is a vibratory motion and that it may be broken up into waves of different lengths to give color sensation. These visible waves lie within definite limits, the wave lengths of the extreme visible red being approximately 760 millimicrons, while the wave lengths of the extreme visible violet are about 385 millimicrons. This range (385 to 760 millimicrons) is, of course, the visible spectrum, beyond which we have the invisible infra-red heat rays and the invisible chemical or actinic ultra-violet rays.

In discussing color with various individuals, we find that beginners have the greatest trouble in orienting their thinking on the functioning of products classified as color. If we can constantly keep in mind that substances called colors or pigments have the property of selective absorption of a certain portion of the visible light rays, and that the portion of the light rays which is not absorbed is reflected as color, this will be helpful in matching colors.

For instance, no color can ever reflect as many light rays as a true white, which contains an equal amount of all wave lengths in the visible spectrum. Hence, the degree of reflection will depend on the individual color pigment and the wave band reflected will determine its position in the visible spectrum. This is an important factor in any discussion of color.

Color Terms Defined

The ability to describe a given color by words is still extremely difficult. This is because the color language is of recent origin and may vary widely in meaning, depending on whether color is being described by a physicist, layman or artist. To have a better understanding of this article, it seems that the definition of color terminology is in order.

The three outstanding qualities of color are hue, brightness and saturation, and these, together with shade, tint and tone, are necessary to complete an effective description. Hue is the predominant wave length reflected by the colored material under consideration which permits its classification as red, yellow, blue, etc. Brightness is a measure of reflectance, using white as standard. Saturation is the percentage of reflected light which is color. It is perhaps one of the most misunderstood words in color terminology. For instance, colors with low saturation are the oranges, yellows and greens. Those with high saturation are the reds. And those with very high saturation are the reddish blues and violets.

A better understanding of color terminology can be secured from the accompanying color scale chart where the wave length in the visual spectrum or chromatic scale is shown in millimicrons of the various colors. Theoretically, the purest color in any segment of the chromatic scale would be one with the narrowest wave band and approaching one wave length as the purest form of hue. In reality, some colors may be made up of a wide wave band but as their wave band increases their saturation or absorption of light increases and hence they have lower reflectance. It will be noted from the chart that white gives the highest brightness (100 percent reflecance or zero saturation) while black gives the lowest brightness (zero reflectance or 100 percent saturation). The colors are therefore intermediate between white and black in relation to their reflectance or saturation.

Use of White or Black

Any colored item may be influenced widely in its reflectance by the addition of white or black and these variations make up the tone scale. Hence, the term "tone" is applicable to the steps in a scale of a single color, comprising the full color as a center and graduated tints and shades leading from it in opposite directions. A tint is a color tone lightened by white, and a shade is a tone darkened by black. A color may also be modified by both black and white to produce a tone or effect that is neither a true tint or shade. Too often in our description of a color the terms "color", "hue", "tint" and "shade" are used loosely and synonymously.

Further study of the chart reveals that any given hue may be influenced greatly by blending with other hues. For instance, a yellow may be varied widely by blending with an orange or yellow green without reducing its brightness or reflection materially. On the other ex-

treme, if one should blend the primary colors—blue, yellow and red—the resultant mixture would vary from a gray to a black, depending on the saturation band of the primary colors. Similarly, a blend of the secondary colors—orange, green and violet—will give a mixture varying from a gray to a black. This is due to the absorption of the visible wave band in the chromatic scale and hence a reduction of reflection of the incident light.

Effect of Materials Themselves

The above may help explain the frustrations and disappointments often encountered in making color matches in unvulcanized stocks, which on subsequent vulcanization do not bear much relationship to the desired hue, tint or shade of the original match. We have indicated that elastomers have a natural color that must be considered when matching colors in such media. In addition, compounding ingredients necessary for producing basic properties, as well as the actual vulcanization of the compounded rubber, also exert effects on appearance. Therefore, changes in appearance take place which are not due to the added colorants. Factors affecting final color appearance are as follows:

(1) Effect of elastomers and compounding ingredients:
- (a) Types and grades of elastomers
- (b) Amount of combined sulfur
- (c) Accelerators
- (d) Antioxidants
- (e) Fillers
- (f) Hard rubber

(2) Effect of various methods of curing:
- (a) Press
- (b) Open steam
- (c) Dry heat
- (d) Sulfur chloride
- (e) Ammonia

A pigment color may be perfectly stable to heat, light, accelerators, antioxidants and sulfur, and yet, when cured in an elastomer, appear to have a hue or shade different from that in the uncured stock. Sometimes the pigment is blamed for this condition when the difference is really due to the change in shade of the base compound itself.

All grades of natural rubber contain some color, although the amount in most of the selected grades of pale crepe is not a serious factor. We know that when combining sulfur with rubber the mixture darkens as the amount of combined sulfur increases, reaching its peak in the blackness of hard rubber. There are also non-rubber constituents in all grades of rubber which tend to darken on prolonged heating. Accelerators such as the aldehydeamines, guanidines and some of the substituted thiazole products will darken rubber compounds substantially more than the zinc salts of mercaptobenzothiazole, the thiurams or the dithiocarbamates. The thiuram accelerators produce the least change. Practically all antioxidants will produce a change in shade of rubber compounds, especially when exposed to sunlight.

All compounding ingredients other than true white pigments will introduce color to a rubber compound. Therefore, if any compound not containing an added color changes materially in shade when cured or when exposed to light, we can expect a change in the shade, tint or hue after adding a color, regardless of the light fastness of the pigment used. This change in color will vary depending on amount and extent of the visible wave band absorbed by the discoloration of the compound itself, either on curing or in exposure to light. Occasionally a white pigment is added to a colored compound to enhance the brightness of the finished product. Since the addition of a white pigment dilutes the color, it tends to add to the color cost, and is not usually necessary in soft rubber compounds where care has been exercised in formulation.

Factors in Pigment Selection

Organic materials as a class are more susceptible to changes due to heat than are inorganic materials, and organic pigment colors are no exception. However, there are organic pigment colors that are very stable to the curing temperatures used in the elastomer industry while there are others that will decompose and will fade out completely during certain types of curing conditions. When selecting a pigment color for use in elastomers it is desirable to know what can be expected of that pigment when the compound to which it is added is cured by various methods. Pigment colors must be carefully selected and classified as to their ability to withstand heat during the various methods of curing. One can often eliminate much work and time in making color matches by first studying carefully the properties of the pigment color under various conditions of cure and subsequent exposure.

The several factors and characteristics that determine the selection of a pigment color for use in elastomers may be divided into economic considerations and pigment properties. Under economic considerations one must consider the following: (a) Cost, (b) Strength, (c) Physical Form, (d) Dispersibility. Where pigment properties are concerned, attention must be paid to these: (a) Light Fastness, (b) Crocking, (c) Bleeding, (d) Migration, (e) Aging, (f) Effect on Cure. All of these factors and characteristics are discussed below.

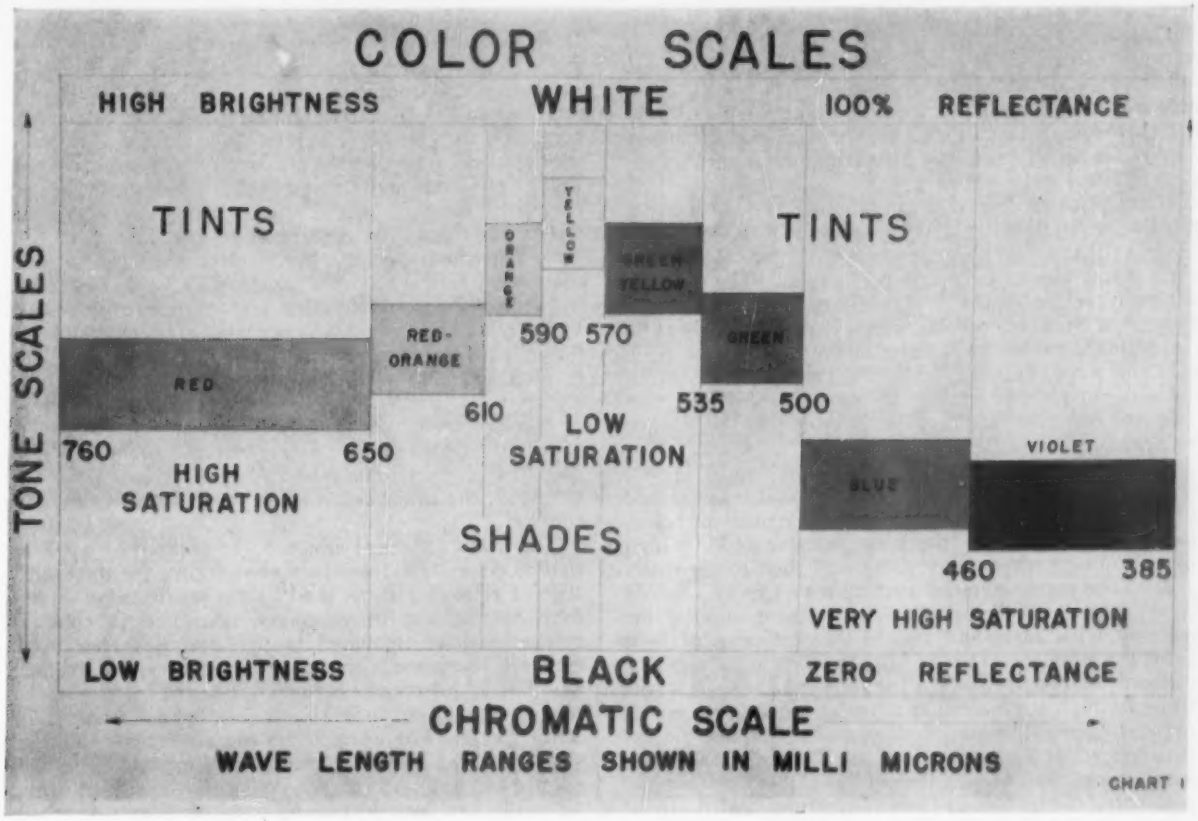
Cost, Strength and Physical Form: Too many color users select pigments on a price basis only, taking into consideration the cost per pound of the pigment rather than the cost per pound of rubber colored. Obviously, color strength is extremely important to obtaining a true color cost, but even this factor must be considered in terms of usable pigment units per package and the degree to which the pigment units can be extended or dispersed in the rubber compound.

Dispersibility: Dispersibility in elastomers is another inherent property of a pigment that affects its economy to a marked degree. If it does not disperse properly, the color strength is low and the color will appear weak and dull; thus, it is important to select pigments that disperse quickly and thoroughly in rubber. Some organic pigments, due to their inherent physical nature, disperse with great difficulty in rubber, while others disperse very readily.

Pigment particles may be of colloidal size when manufactured in an aqueous medium, but on drying may cake in very hard agglomerates which are not easily broken up on grinding. While a pigment of this nature may be ground very fine and disperse satisfactorily, the grinding operation may cause the pigment to fracture with uneven surfaces, which will refract part of the light, giving the effect of dullness and weakness.

In selecting a pigment on a cost basis bear in mind its physical form, dispersibility in rubber and real strength as used, as well as its cost per pound.

Light Fastness: The selection of a pigment will depend on what it does in rubber in addition to providing the



The wave length in the visual spectrum or chromatic scale is shown in millimicrons of the various colors on this color scale chart. Note that white gives the highest brightness (100 percent reflectance or zero saturation) while black gives the lowest brightness (zero reflectance or 100 percent saturation).

desired hue, tint or shade. Fading is one of the most important considerations. Yet this property can be overemphasized in importance when the product will not normally be exposed to strong sunlight and can be confused with discoloration of the product from accelerators and/or antioxidants, or with the change caused by surface oxidation of the rubber. Organic pigments may fade or change color in themselves when exposed to strong light, but in many cases the change called "fading" is due to other changes within or of the rubber compound itself.

Crocking: Crocking as applied to colored rubber is the term used to describe the property of a pigment that causes it to stain a damp cloth which is rubbed over the surface of the rubber. Normally, where crocking is a factor, as in rubberized fabrics, the surface of the rubber may be treated with a water varnish, nitrocellulose lacquer or other material. If the pigment used in the rubber is soluble in the surface finish it may be removed from the finish by rubbing, in the form of a stain. If the rubber does not have a surface finish, then crocking is a function of the solubility of the pigment in water, the solubility of the pigment in the rubber or chalking of the rubber surface when exposed to sunlight.

Crocking as a result of chalking is not necessarily a function of the pigment, but is the result of surface oxidation of the rubber, which permits the removal of small particles of rubber and pigments which may stain a dry or wet cloth rubbed over the surface.

Bleeding: Naturally, a pigment soluble in water, when used in rubber will tend to stain a wet cloth rubbed over the surface. The degree of staining will depend on its solubility in water and its concentration in the compound. Often a low concentration in rubber of water-soluble pigments causes very little or no bleeding.

Migration: A pigment that is soluble in rubber is known as a migrating pigment, as particles of it will move to and color an adjacent piece of rubber. Sometimes a rubber-soluble pigment is used in concentrations greater than its solubility in rubber and as a result it will migrate to the surface. A pigment of this nature is usually the worst offender in crocking, and should be avoided where freedom from crocking is of importance.

Aging: The effect on aging should be taken into consideration when selecting pigments for use in elastomers. Most of the pigments either have no effect or provide slight protection to rubber as judged by aging in the oxygen bomb. They do not adversely affect aging.

Effect on Cure: The effect of pigments on the rate of cure is another important factor to be considered in selecting colors for use in elastomers. Pigments may retard or activate one class of accelerator and be neutral with others.

Effect of Surface on Color Appearance

Aside from the above factors, the matching of color in elastomers can present a problem if the surface con-

dition of the item to be matched differs from the surface condition of the vulcanized colored elastomer. For instance, one may wish to duplicate such items as a colored fabric, colored coated paper or colored lacquered coating on a smooth metal surface. To do this successfully the surface of the vulcanized colored elastomer should duplicate as nearly as possible in configuration or smoothness the item to be matched.

A rough or contoured surface, sometimes obtained by molding or embossing a design into the rubber, casts shadows that affect the appearance of the color, especially when viewed from different angles. The color of a rough surface would therefore appear quite different from that of a smooth surface, even though the same compounded rubber base and a like amount of the same colorant were present. Similarly, the appearance of a colored smooth dull surface appears different than that of a colored smooth glossy surface, due to the greater reflectance of the latter.

A colored vulcanizate that is to be used under service conditions where the surface may be abraded or scuffed often requires the addition of a higher amount of colorant. This is especially true if the vulcanizate has a high filler loading such as floor tiling and shoe soling materials. The cut or abraded surface may appear weak in contrast to the molded surface due to the dilution of the colorant with fillers and also to the scattering of light from the abraded surface. This contrast usually can be reduced by two methods of adding color. One is the use of a high concentration of either an organic or inorganic color. The use of all organic color may be expensive, while the addition of all inorganic color may result in dullness. Hence, the preferred method is usually a mixture of the two to obtain brightness and depth of color on the cut or abraded surface.

Another condition that can be baffling at times is light itself. It is possible to have two physically different colors that will appear to match under a specific source of illumination, but will no longer appear to match if the illumination is altered. This means simply that the term "color match" is susceptible to two interpretations —visual and physical. If two colors have the same dominant wave length, brightness and purity, they will match visually under the standard viewing conditions but not necessarily under a different set of conditions. On the other hand, if they match physically, as indicated by identical reflectance curves, they will always match under any conditions. This is because colors that match physically will always absorb the same wave bands of the incident light and reflect the light rays that are not absorbed. Those that do not match physically absorb different wave bands and the resultant reflected color may vary widely, depending on the composition of the incident light rays.

Appearance of Adjacent Colors

The contrast of colors is an interesting and important phenomenon which appears when two or more colors are placed in close relation with one another, especially if one color is extremely bright and strong. A color may appear bright, strong and rich when compared with a duller color and yet appear dull and lifeless alongside a brighter color. This is especially true when equal areas of two similar colors having different degrees of brightness and purity are placed together in the same pattern. To the uninitiated in color matching, this contrast, or the neutral influence which contiguous colors exert upon one another, can be baffling and may lead to rejection of a color that, when viewed alone, may be very attractive and practical.

The use of one color to complement another, when done correctly, can result in very harmonious and pleasing effects. Artists, decorators, designers and architects often use complementary colors to create pleasing contrasts and to enhance trade acceptance of their products. This is accomplished by selecting hues directly opposite each other in the chromatic scale, such as red and green, blue and orange, yellow and violet. The colors are complementary because they balance at neutrality when mixed in the proper proportions.

Complementary color schemes offer great varieties of color relationships from the strongest to the weakest contrast, depending on brightness and strength adjustment. When complementary colors are used together they have the effect of making each other more brilliant. This should be borne in mind in selecting the proper brightness and strength, because if the same brightness and extreme strength of each color are used, an unpleasant condition of vibration between the two colors will occur. If one color of a pair of complementaries is weakened in strength, the other color will appear still brighter by contrast.

The many attractive effects to be realized by application of color should assure a good future for the multitude of elastomer items used by the public today. However, the amount of elastomer fabricated in color is relatively small compared to the total elastomer used. So small compared with that in the plastics field, in fact, that one wonders if the rubber industry is missing an opportunity to enhance its business by not using color more freely. For example, in the automotive industry cars are being painted in multiple colors, while the bulk of tire sidewalls are black. Whereas the use of white sidewalls has been increasing, colored sidewalls, which lend a bit of harmony to cars, are still rather small in volume.

Summary

While the above variables may seem complex and complicated and appear to offer many pitfalls when adding a colorant to elastomers to create a desired effect, the problems may be simplified by understanding and following the rules shown below.

(1) Keep in mind that pigment colors are materials, either organic or inorganic in nature, which have the property of selective absorption of light rays, and that some portion of the visible light not absorbed is reflected as color.

(2) Select a base compound with as little color as possible and one that doesn't change on vulcanization because of the curing conditions that one plans on using.

(3) Select an easy dispersing color that is stable to the curing condition used and to the subsequent exposure of the vulcanizate.

(4) Select a bright color if brilliance is desired. Aside from the fact that a bright color may have more eye appeal, it is usually much easier to alter by blending or shading with another color, or by the addition of black, to get the desired tone effect.

(5) When blending colors to alter the hue without dulling, select a color with a narrow wave band which is adjacent to the color under consideration. Example: Blend an orange red with a reddish orange. Blend a yellow orange with an orange yellow, etc. Blends of a bluish red and a greenish yellow would result in dullness.

(6) Select colors based on tinctorial strength and ease of dispersion instead of cost per pound.

(7) For best economy, use white pigment only for tints or toning of shades.

Aerial view of Ober-Ramstadt Ordnance Tire Rebuilding Depot near Frankfurt, Germany

How the Army's Tire Technicians Save Rubber and Money

U. S. Forces at Depot in West Germany Are Saving Taxpayers Some $5 Million Annually by Reclaiming Tires and Making New Products

A SIGN proclaiming that "Through These Portals Pass Some of The Finest Rebuilt Tires In The World" might well be erected over the entrance to the U. S. Army (Europe) Tire Rebuilding Depot at Ober-Ramstadt, West Germany. Operations at the depot, the only Army installation on the European continent producing tires and other rubber products for USAREUR units, have resulted in a saving of some $5,000,000 a year and more than $50,000,000 during its ten years of existence.

In May of this year the one millionth reclaimed tire rolled out of the depot's production section. Every day 385 tires, 600 rubber shoe pads for tank treads, and 40 tank tread solid rubber-tired wheels are rebuilt. This same average day sees the manufacture of dozens of vital rubber items, ranging from bean-sized grommets to light aircraft propeller diaphragms.

Army tires—and almost any size can be rebuilt at Ober-Ramstadt—go through a step-by-step process which results in a gleaming finished product with the distinctive diamond tread of the depot.

Tire reprocessing commences in the buffing room, where the old tread is removed. Simultaneously, foreign matter such as nails and spikes—and on one occasion a car door handle—are extracted. Some damaged tires, requiring a new section, are restored to normal condition by putting in an inset, then vulcanizing. An application of heavy rubber cement comes next. This provides an adhesive for the tread rubber (camelback) which serves as the basis for the capping.

After final vulcanizing, air bags are inserted into the tire before it is vulcanized in a mold heated to 300° F. The bag exerts pressure against the tire to keep it firm during the two-hour molding operation. After removal from the mold, the excess rubber flashing is trimmed, and the tire receives a final inspection prior to going to the storage warehouse. The tire is then ready for issue, and soon will keep some USAREUR vehicle, ranging from a jeep to a road grader, rolling on its Army mission.

Vital sidelines to tire reclaiming are the reclaiming of thousands of tubes annually and the manufacture of over 1,000 different rubber items. These are created to maintain the stockpile needed in Europe, and to support Department of the Army modification work orders.

All manufactured rubber items, processed on molds built in the machine shop section, are realized from rubber salvaged from the tire recapping process. These items include bushings, shock absorbers, gaskets, weatherstripping, engine mounts, hosings, windshield wiper bands and master cylinder boots.

The plant has developed and perfected a special civilian-type tire tread, first experimented with and used in Africa. As a "mark of quality", all reprocessed tires are identified with the Ober-Ramstadt mold and a new serial number.

The rebuilding or replacing of rubber on tank wheels, known as "solid-type" work, has become an important part of the shop's activities. The wheels are collected at

Tread rubber being applied to a group of tires at the Army depot. Over one million tires of all kinds have been recapped since 1946.

Recapped tires being removed from the molds. The depot is also equipped with compression molds for handling small mechanical goods.

central depots, and are processed as required. Some need entirely new rubber, involving rubber-to-metal processing; others can be repaired by grinding down the original rubber and attaching the required amount of new packing. Wheels are then inserted in molds, five at a time, for curing the rubber.

There is no wastage at Ober-Ramstadt. The re-processing of the excess rubber extends even to scraps which are turned into stair and floor matting for use in USAREUR installation offices and workshops.

All work at the depot is based on OMO's, or Ordnance Maintenance Orders, which are requisitions from USAREUR Ordnance headquarters at Heidelberg, and represent Army vehicle rubber needs from all over Europe.

Under command of the 53rd Ordnance Group, and operated by the 7844th Army Unit, the depot is under the direction of Lieut. Colonel Blaine Mathis of (Paseo Pueblo) Saratoga, Calif. Four staff officers, 11 enlisted men, and 275 German employees make up the rest of the specialist staff.

The money and rubber-saving installation, during its ten years of operation, has set excellent records in maintenance of labor relations, prevention of industrial accidents, and safe-driving in vehicle operations. All these accomplishments are in the best Army tradition and provide a worthy example for civilian industry to follow. Many of our most productive ideas are based on experience of the armed forces, and the indications are that there are more where those came from.

Coming Next Month.....

"Properties of Silicone Modified Rubbers (SMR)"—by Ellis H. Phreaner, Consulting Rubber Chemist, Stoner Rubber Co., Anaheim, Calif.

A comprehensive description of the effects of adding silicone oils to conventional rubber compounds. How this method modifies products to give unique qualities is thoroughly documented with the aid of extensive tables and charts.

"The Reaction of Molecular Oxygen with Rubber"—by E. M. Bevilacqua, General Laboratories, U. S. Rubber Co., Passaic, N. J.

Discusses organic chemistry of the steps leading to effect of scission of natural rubber. The paper was presented at the recent meeting of the Rubber Chemistry Division, Chemical Institute of Canada.

Symposium on Mechanical Rubber Goods.

Covers questions and answers relative to latest developments in belting, hose, small molded goods and cellular rubber goods, compounding and equipment, as discussed by six panelists during the Fall Meeting of the New York Rubber Group.

Plus several short practical articles.

Dilute Solution Viscosity

Its Use and Interpretation with GR-S Polymers

By JUNE DUKE* and DOROTHY PREM*

Government Laboratories, University of Akron, Akron, Ohio

The procedure used at the Government Laboratories for rapid measurements of viscosities of large numbers of samples is detailed and a brief discussion of viscometry and its use for molecular weight determination is presented.

Dilute solution viscosities (DSV), which can be determined as a routine laboratory analysis, utilizing a single, fairly low concentration, are not as precise as measurements of intrinsic viscosities, but have been found to be valuable as a simple and rapid means of characterizing and comparing polymer molecular weight relationships.

With polybutadiene or 71/29 butadiene-styrene polymers prepared at 41° or 122° F., differences between DSV and intrinsic viscosity are less than 10%, nearly always in the same direction, and reasonably constant over the conversion range below the gel point. It is suggested that the use of DSV as an indication of comparative differences between polymers is as reliable as the more expensive determination of intrinsic viscosity.

SINCE the first decade of this century, viscosities of dilute solutions have been of interest as an indication of solute molecular weight. Although such viscosities do not afford a direct measure of molecular weight, they do provide a valuable means of characterizing and comparing high polymers and of obtaining data which may be interpreted as behavior characteristics of the polymer molecules under the given conditions.

Solution viscosities, in contrast to measurements of absolute molecular weight, can be obtained rapidly in large numbers with relatively simple equipment by trained laboratory technicians. Much information can be found in the literature on the general subject of viscometry but detailed laboratory procedures are not as readily available.

Viscosity measurements of dilute solutions have been used extensively at the Government Laboratories to characterize high polymers, and figures for dilute solution viscosity (DSV) have been published in a number of papers originating from this laboratory. The principal purpose of this paper is to describe the Government Laboratories method in such detail that it will be available to others interested in carrying out similar determinations or in reproducing the data published by the Laboratories.

A brief description of the procedure and a discussion of the theoretical background might also assist in interpreting the data previously published. In accord with this aim a procedure for making DSV measurements is presented here which is suitable for routine laboratory analysis of large numbers of samples. The method may be modified within certain limits to give greatest rapidity of analysis which is consistent with accurate measurement and the precision desired. Some information is also included which indicates the limitations of an inherent viscosity measured at a single concentration.

Procedure

There are several similar types of capillary viscometers in use, including the Ostwald, Ubbelohde and Fenske viscometers, as well as modifications of these types for special purposes. Several different viscosity calculations are possible from the data obtained with any of these types of viscometer.

In this laboratory, an Ostwald viscometer, such as that shown in Figure 1, is used. The viscometers are chosen to have for 5 ml. of benzene a flow time greater than 120 seconds and less than 160 seconds. The Ostwald viscometer has been preferred in this laboratory since it requires only a small amount of solution and the smaller and simpler design is better adapted for several simultaneous measurements.

Each viscometer is inserted in a small rubber block cut from cured rubber scraps into which holes have been bored for the purpose; it has been found convenient to slit the blocks from the outer edge to each opening, thus

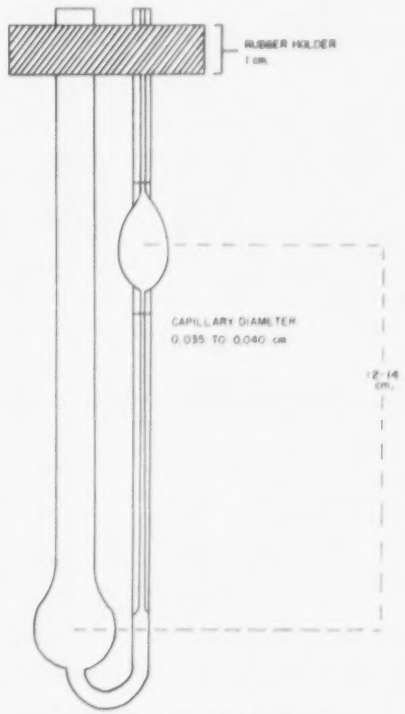


FIG. 1—Ostwald viscometer.

* Present address: Olin Mathieson Chemical Corp., P. O. Box 480, Niagara Falls, N. Y.

allowing easy insertion and removal of the viscometer. An identification number is etched on the glass and is also marked on the rubber holder with a silver pencil so that the number can readily be seen when the viscometers are immersed in the bath, thus minimizing sample mix-up.

The rubber block holding the viscometer fits snugly into slots in an aluminum rack (Figure 2) which fits across the top of an aquarium type water bath kept at 25 ± 0.05°C. Thus, the viscometers are maintained in a vertical position and are always immersed to about the same depth—about one inch from the top.

Each viscometer is calibrated by pipetting 5 ml. of the solvent which is to be used in the determination proper into the reservoir side of a clean, dry viscometer. The viscometer is then placed in the bath for 10 minutes to attain constant temperature of the equipment and liquid. At the end of this time, the solvent is forced through the capillary, filling the bulb, by means of a few millimeters of nitrogen pressure on the reservoir side of the viscometer. The time required for the meniscus to pass freely from the upper to the lower line is measured to 0.1 second with a stopwatch. Determinations are repeated until three flow time values agree within 0.5 second. The benzene is then removed, the viscometer is thoroughly rinsed with chloroform, and dried before using again. The efflux time of 5 ml. of solution is determined in the same manner.

Determining Concentration

The solution normally used is that remaining from gel determinations and from which all insoluble material has been filtered. The concentration of the solution used for viscosity measurements (approximately 0.25%) is determined accurately by evaporating a 50 ml. aliquot on a steam plate at about 78°C. and obtaining the weight of the residue. In the viscosity calculations, the concentration is always expressed in grams per hundred ml.

The precision of the determination can be increased by sacrificing some of the rapidity of the determination.

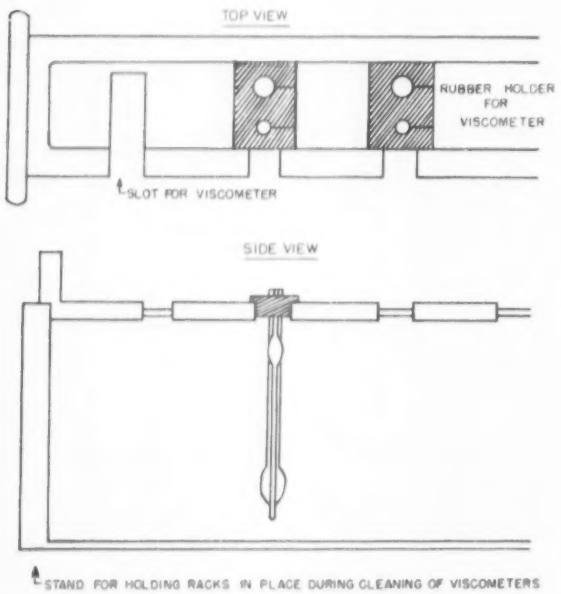

TOP VIEW
RUBBER HOLDER FOR VISCOMETER
SLOT FOR VISCOMETER
SIDE VIEW
STAND FOR HOLDING RACKS IN PLACE DURING CLEANING OF VISCOMETERS

FIG. 2—Metal rack for suspending viscometers in bath.

Some of the factors which increase the precision are improving temperature control, lengthening the capillary or decreasing its diameter to decrease kinetic energy effects, maintaining a smaller range between the flow times of each determination, and repeating viscometer calibration frequently. In this laboratory, for routine work, the viscometers are thoroughly cleaned with cold concentrated nitric acid once a week, and calibrated after this cleaning. They are carefully rinsed with clean chloroform after each determination and dried before reuse.

For practical use, the racks shown at the top of Figure 2 are made to hold 15 viscometers, thus allowing a trained technician to have up to 15 measurements under way at one time.

Calculations

From the data thus obtained, several types of viscosity can be calculated. The actual viscosity of solution, η_s, and of solvent, η_o, are rarely calculated as they are respectively proportional to flow time of solution, t_s, and flow time of solvent, t_o; therefore, it is possible to utilize the ratio $\frac{t_s}{t_o}$, as equivalent to $\frac{\eta_s}{\eta_o}$, (the relative viscosity, η_r) without calculating the actual viscosities.

The specific viscosity, η_{sp}, expresses the fractional increase in viscosity due to polymeric solute, and is equal to

$$\frac{t_s - t_o}{t_o} = \eta_r - 1.$$

Reduced specific viscosity, $\frac{\eta_{sp}}{c}$, is a measure of the specific capacity of the polymer solute to increase the relative viscosity. At low concentrations (less than 0.5 gm/100 ml.), the relationship shown by plotting the reduced specific viscosity or the inherent viscosity, $\frac{\ln \eta_r}{c}$, versus concentration is very nearly linear. Such a plot for $\frac{\eta_{sp}}{c}$ has a positive slope, while one for $\frac{\ln \eta_r}{c}$ is usually negative for gel-free polymers made by emulsion polymerization up to viscosity values approaching 4. These two plots approach the same limit as c approaches o. This limit is the intrinsic viscosity $[\eta]$ which is related to molecular weight. Intrinsic viscosity has the dimensions of a specific volume, and it has become customary to express concentration as grams per 100 ml. and $[\eta]$ in deciliters/gram.

Discussion

In view of the availability of excellent discussions of the general subject of viscosity by Mark *(7,8)*, Flory *(6)*, Alfrey *(1)*, von Amerongen *(10)*, Burnett *(2)*, Ewart *(5)*, and Wood *(11)* in the texts listed in the bibliography, only a brief discussion of the background material will be presented here.

All theoretical considerations using viscosity measurements to determine molecular weight are based on Einstein's equation for viscosity of liquids containing spheres in suspension, namely:

$$\eta_{sp} = 2.5\phi,$$

in which ϕ represents the volume fraction of the sphere and is proportional to the molecular weight *(3,4)*. The early work with spherical particles, later extended to include ellipsoid particles, postulated that η_{sp} depended on concentration alone; however, this was found not to be true for high polymer molecules, which are neither solid nor regular in shape.

In the second decade of this century, a connection between dilute solution viscosity and molecular weight was recognized, but the nature of the dependence was not explained mathematically. Staudinger's equation *(9)*, which appeared some twenty years later, gave great impetus to investigation in this field, although the equation itself,

$$\eta_{sp} = KCM,$$

where M equals the mean molecular weight, K is a constant characteristic of the type of polymer, and C equals concentration in base moles per liter, has been found to be more limited in scope than proposed by Staudinger. It assumed Newtonian flow directly proportional to molecular weight and molar concentration, independent of temperature and solvent, as well as rigidly elongated molecules. The equation appears valid only at very low concentrations where there is no molecular interaction, and even then only for a short molecular weight range.

Intrinsic Viscosity Defined

In order to avoid the complications introduced by concentration effects, $[\eta]$, intrinsic viscosity has been defined as the viscosity expression generally related to molecular weight in such simple equations as

$$[\eta] = KM^a$$

where M equals molecular weight, and K and a are constants. K and a are specific for a given polymer-solvent system at a given temperature, and may be established by determining the molecular weights of a series of homogeneous fractions of that polymer, using both an absolute molecular weight method, such as osmotic pressure, and the intrinsic viscosities of the same fractions. Once the constants have been established, the molecular weights of subsequent samples of that polymer may be computed from their intrinsic viscosities.

The equation $[\eta] = KM^a$ is empirical in origin; however, the more complex expressions resulting from the consideration of branching and shape of the molecule, as well as solvent effects, can be approximated by it over quite a wide range of molecular weights.

The dependence of reduced specific and inherent viscosities on concentration has also been the subject of numerous investigations, and a number of equations relating $[\eta]$ to concentration have been proposed. It has been shown that the slope of the curve which results when $\frac{\eta_{sp}}{c}$ is plotted versus c is positive and of much greater magnitude than that of $\frac{\ln \eta_r}{c}$, which is usually negative. Since viscosity is sensitive not only to the mass but also to the shape of the molecules, such factors as branching and solvency, which influence the extension of the molecule, affect the slope of the viscosity-concentration curve and the measured viscosity value itself.

Difference in Two Types of Viscosity

When absolute molecular weight values are not required, inherent viscosity at a single concentration may be as useful as intrinsic viscosity for characterizing a polymer, and is obviously a great deal more rapid and possibly as reliable when a large number of polymers are to be handled. Figure 3 shows two typical $\frac{\eta_{sp}}{c}$ and $\frac{\ln \eta_r}{c}$ versus concentration curves, one for 122°F. GR-S and one for 41°F. GR-S. These curves point out the difference in slope of the two types of viscosity, and indicate that for gel-free butadiene-styrene elastomers having

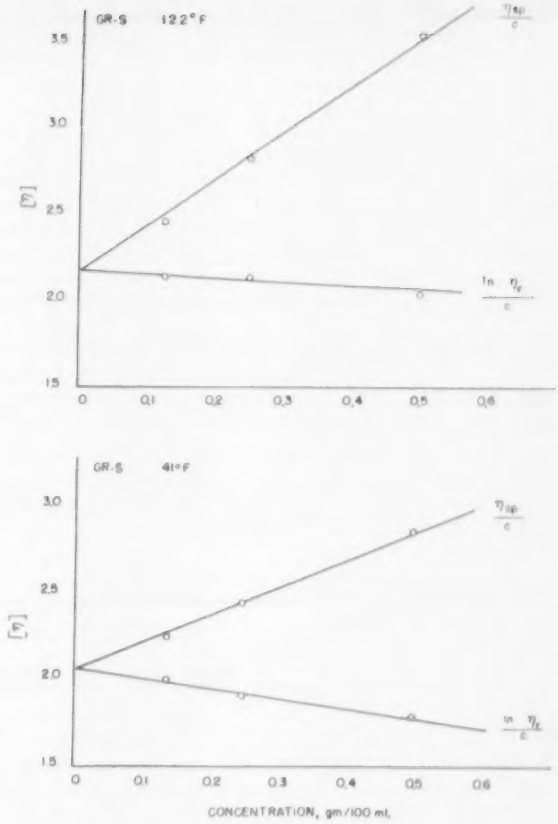


FIG. 3—Viscosity-concentration relationship.

viscosities of about 2, the difference between inherent viscosity determined at 0.25 gm/100 ml. concentration and intrinsic viscosity is small enough to be ignored in all but the most precise work.

The inherent viscosity, determined at a concentration of about 0.25 gm/100 ml., is the value most often used in viscosity studies at the Government Laboratories and is usually referred to as dilute solution viscosity, or DSV.

A rather extensive study has been made of the deviation of DSV from intrinsic viscosity, both with polybutadiene and 71/29 butadiene-styrene polymers, prepared at temperatures of 122°, 41° and 0°F. Modifier level was varied and samples were taken at conversion intervals, so that a wide range of molecular weight and gel points was obtained. The DSV and intrinsic viscosity values were determined for each sample. As a means of comparison, the deviation of the DSV from the intrinsic viscosity value has been calculated as the percent error resulting from a test made at a single concentration (0.25 gm/100 ml.). Deviations of the polybutadiene samples at all temperatures have been found to be somewhat less than for the copolymer, and the deviations become greater as polymerization temperature is lowered. The "errors" in DSV for each series, averaged without regard to molecular weight, but including only soluble polymers, may be summarized as follows:

	Polybutadiene			GR-S		
Polymerization Temp., °F..	122	41	0	122	41	0
Error in DSV, %	4.3	7.4	10.1	4.3	9.5	13.3

The use of DSV at a concentration of 0.25 gm/100 ml. for the polymers prepared at 41° and 122°F. resulted

in comparative values which were less than 10% in error, assuming the intrinsic viscosity values to be absolute. When temperatures lower than 41°F. were used, the error became greater, but was relatively constant.

The error can be reduced by using a concentration of 0.1 gm/100 ml. for the 41°F. polymerization, but the accuracy of the determinations will be poorer, thus minimizing the advantage of a quick, routine test where comparisons of samples rather than absolute values are desired. The equations relating viscosity and molecular weight are precise only when conversion factors are determined precisely for the particular system under investigation. However, when it is desired to compare the effects of specific variables on essentially like systems, DSV determinations are as informative as would be intrinsic viscosity results. With unfamiliar systems, however, the relationship should be established before accepting the use of DSV.

SPECIAL NOTE

The work discussed herein was performed as a part of the research project sponsored by the National Science Foundation.

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Increasing the Accuracy of pH Measurements

TO increase the accuracy of pH measurements in the highly alkaline range, the National Bureau of Standards is recommending a sixth pH standard for use along with the five pH standards previously established. Consisting of a saturated solution of calcium hydroxide, the new standard will provide an additional fixed point in the standard pH scale which the Bureau maintains.

This scale was set up in 1948 to meet the need for a single standard pH scale as a basis for accurate measurement of acidity and basicity in aqueous solutions. In the manufacture of many commercial products—for example, paper, textiles, dyes, and ceramics—the rapidity and efficiency of the processes depend upon the accuracy with which pH can be determined.

Definition of Standard

The NBS standard pH scale is defined in terms of several fixed points in much the same manner as is the International Temperature Scale. The primary standards of the pH scale are solutions whose pH values are only slightly affected by dilution or by accidental contamination with traces of acid or alkali from the walls of the container or from the atmosphere. The substances from which the standard solutions are prepared are, in turn, stable materials which may be obtained as certified standard samples from the Bureau. The five standards thus far established cover the pH range from 1.68 to 9.18 at 25°C. However, the need for a highly alkaline standard has been felt for several years.

The new pH standard is a solution of calcium hydroxide saturated at 25°C. This reference solution is very easily prepared. No weighings are necessary, as a solution of reproducible composition can be made merely by shaking finely granular calcium hydroxide with water. The calcium hydroxide is prepared by igniting calcium carbonate conforming to American Chemical Society specifications for the reagent grade low in alkalies.

The solid material must not be contaminated with soluble alkalies, but the presence of carbonate is of no concern, since calcium carbonate will precipitate from the solution at the time of preparation. The filtered solution of calcium hydroxide supersaturates readily and can normally be used over a wide range of temperatures without separation of the solid phase.

The pH of this solution is 12.45 at 25°C. and is a rather sensitive function of temperature. Values of pH on the NBS conventional activity pH scale have been assigned at intervals of 5 degrees from 0° to 60°C. Although standard samples of calcium hydroxide are not yet available from the Bureau, highly pure preparations can be readily made from commercially available grades of calcium carbonate.

Further Details Available

For further details concerning the sixth pH standard recommended by the National Bureau of Standards the reader is referred to the article on "Calcium Hydroxide as a Highly Alkaline pH Standard," by R. G. Bates, V. E. Bower and E. R. Smith, which appeared in a recent issue of the *Journal of Research of the National Bureau of Standards* [(Vol. 56, page 305 (1956)]. Some information on the standardization of the pH scale appeared in the *NBS Technical News Bulletin* [(Vol. 31, page 138 (1947)].

Designed for use where space is severely limited, **miniature Baldwin SR-4 load cells** for electrical measurement of forces and weights up to 10,000 pounds in compression have been developed by the Baldwin - Lima - Hamilton Corp., Philadelphia 42, Penna. The cells are less than 2 inches in diameter and only 2¼ inches high over-all. Calibration accuracy is within plus or minus ¼% of full range at any load at 70° F. Resistance across power terminals is 120 ohms.

Editorials . . .

Unusual Situation

THE current issue of *Natural Rubber News*, the factual and readable monthly bulletin issued by the Natural Rubber Bureau, points up an unusual situation where the two major premium products of natural rubber are concerned, namely, liquid latex and pale crepe. Both of these products have been experiencing opposite end-of-the-pole reactions in recent months. The premium for latex has been hovering between 4 and 5 cents a pound, against the traditional 8 to 10 cent differential, while the premium for pale crepe has soared to 10 to 11 cents a pound, the highest recorded in the past thirty years.

How this situation came about makes an interesting tale. The consumption of natural latex, as reported by the Bureau, has shown a substantial decline from the 1955 rate. The average monthly consumption rate in 1955 amounted to 7,206 long tons, whereas the corresponding rate for the current year, based on the first seven months, amounted to 5,461 long tons, a drop of 25 percent. The average monthly consumption rate for GR-S latex, however, has shown only a slight decline, the figures being 5,332 long tons and 5,028 long tons, respectively.

Due to sharp falling off in demand for latex foam from the furniture and mattress fields, both of which were in the doldrums for the first half of the current year, plus the drastic curtailment in the manufacture of automobiles, latex stocks have begun to pile up somewhat. Based on the previous seven months' consumption figure, stocks of natural latex on July 31 last represented a 3.6 months' supply, as compared with a 1.8 months' supply on December 31 last, based on twelve full months of consumption. This is in keeping with the traditional feast-or-famine situation in the latex field, which is indicative of the almost constant problem facing both producers and importers of natural latex, to say nothing of the consumers. Obviously, when the supply increases and the demand decreases there is a resultant decrease in the premium position.

There is a definite time lag between the production of latex and shipments and use. When importers cut back on their demands from the producers the latter begin giving thought to switching from latex to dry rubber production. When the demand is strong for liquid latex the swing is made the other way. Presumably, as the Natural Rubber Bureau points out, at some time during the past several months producers converted from pale crepe manufacture to liquid latex. This action, coupled with the drop in demand from the latex foam manufacturers, contributed to the current high stock situation in the United States.

The present high premium rate for pale crepe, on the other hand, is directly due to shortage of supply. The switch from pale crepe manufacture to liquid latex on the part of the producers considerably shortened pale crepe supplies and this situation, combined with a slight increase in the demand for this premium rubber, has resulted in the peak premium rate which currently exists. This premium rate fluctuates widely and in the past eight years has varied between 1.47 cents to 10.50 cents. The average premium rate for the period has been 4.82 cents a pound.

It should be borne in mind, however, that the feast-and-famine situation which plagues the latex industry can rapidly turn to a famine-and-feast situation. This has happened time and again. Imports of natural latex are off sharply and if they continue in this direction for the next few months the premium price could easily move back into the 8 to 10-cent range. Further, there are indications that demand is picking up sharply, particularly from the automotive field which is already launched on production of the 1957 models. It is conceivable, therefore, that the premium positions of liquid latex and pale crepe may revert to their traditional pattern within the relatively near future.

Another Advance

SOME of our more alert readers may have taken notice of the fact that the front cover of this issue contains a new insignia—ABP. The addition of this insignia on our cover, and on all of our new promotional literature, means that we have been accepted as a member of the Associated Business Publications, Inc. This is an organization which for the past fifty years has been devoted to the upgrading of trade journals. Its membership includes some of the outstanding business, merchandising and technical journals of our era. What does this membership mean to our own readers? It means that as a result of the numerous clinics conducted by ABP our editors will learn more about proper presentation of the materials with which they deal. It means they will be alerted to every progressive step in the publishing field. It means that they will be in a position to furnish you, the reader, with improved format, improved design and increased readability. We think we know our jobs, but are ready to learn. What we learn will be passed along to you. We are proud to join the distinguished company which constitutes the Associated Business Publications, Inc.

Highlights Sidelights *of the News . . .*

October, 1956

The Rubber Producing Facilities Disposal Commission terminated its activities on September 23, thus bringing to an end a three-year operational period . . . The Federal Facilities Corporation has taken over the remnants of the disposal program . . . The FFC has now undertaken to lease the government-owned alcohol-butadiene facility at Louisville, Ky., with bids to be received through October 31 . . . The Louisville unit is now under lease to Publicker Industries, Inc., of Philadelphia, Penna. (page 89).

The Federal Trade Commission has begun its hearings on restraint-of-trade complaints against Goodrich and the Texas Co. . . . Similar complaints against Goodyear, Firestone, Shell Oil and Atlantic Refining will also be heard in future weeks . . . The cases involve "over-riding commissions" — those fees paid by rubber firms to oil companies in the sale of tires, batteries and accessories through stations handling the oil company products (page 96).

Four major rubber companies have signed agreements with the United Rubber Workers granting supplemental unemployment benefits to 100,000 rubber workers in 47 plants . . . The plans call for payment by the companies of supplemental unemployment benefits of 65% of normal after-tax weekly take-home pay for a maximum of twenty-six weeks . . . The plan will require the four companies to pay into the fund an amount equal to three cents an hour for each employee covered (page 93).

The General Services Administration is polling some twenty-four Federal agencies to determine whether there is an existing need within the Federal establishment for the government laboratories at the University of Akron . . . The laboratories, built in 1943 and used as a pilot plant in synthetic rubber research, will then be offered for bidding at a public sale . . . The laboratories were operated until recently by the University of Akron and are now in standby condition (page 89).

Initial steps have now been taken for the organization of a Southern Rubber Group . . . The new group will hold its first organizational meeting on November 16 and 17 at the Jung Hotel in New Orleans, La. . . . The meeting will be open to all who are interested in the rubber industry . . . Dr. B. S. Garvey, Jr., new chairman of the A.C.S. Rubber Division, and M. E. Lerner, editor of RUBBER AGE, will address the meeting (page 99).

In recent years, many of the local rubber groups have undertaken the presentation of courses in rubber technology as a supplement to their usual activities . . . A number of the local groups have now announced their plans for the new Fall season . . . Many of thhe courses are being presented in conjunction with institutions of higher learning so that, in many cases, these courses carry credits toward a degree (page 104).

NEWS REPORTS and Industry Activities

FFC TAKES OVER DISPOSAL COMMISSION DUTIES; OFFERS LOUISVILLE ALCOHOL-BUTADIENE LEASE

AT midnight, September 23, the Rubber Producing Facilities Disposal Commission terminated its activities, thus bringing to a close a three-year operational period. The Federal Facilities Corporation took over, on September 24, the remnants of the government's synthetic rubber program and as one of its first acts announced that proposals to lease the government-owned alcohol-butadiene plant at Louisville, Ky., would be received during the period ending October 31, 1956. In its almost three years of operation, the Disposal Commission sold 26 of 27 government-owned plants for the production of synthetic rubber and miscellaneous equipment for $284,848,000, and leased the remaining plant, the Louisville alcohol-butadiene unit, to Publicker Industries through April, 1958. FFC has inherited the administration of this lease and a lease covering related catalyst equipment at Baltimore, Md. It will also take responsibility for collecting the balance on four mortgages and guaranteeing compliance with the national security clauses inserted in every disposal contract. Under these clauses, each facility must remain available for synthetic rubber production for ten years after transfer to private hands. The White House stated that all duties transferred to FFC will be subject to direction and control by the Secretary of the Treasury.

When it went out of business on Sunday, September 23, the three-man Disposal Commission closed out a 10-year-old disposal program which returned more than $453,000,000 to the Government and transferred to private industry the title to more than 50 facilities built since 1943.

All but 27 were sold under Democratic Administrations; the rest, except those under lease, were sold by the Eisenhower-appointed commission: Holman D. Pettibone of Chicago, Ill., chairman; Leslie R. Rounds of Kennebunkport, Me., vice-chairman, and Everett R. Cook of Memphis, Tenn.

The government's decision to get out of the rubber-producing business, begun under President Truman and continued by President Eisenhower, brought into being about eighteen months ago a new industry with a capacity to produce about 730,000 long tons of GR-S type rubber. The industry will have the capacity to produce more than 1,000,000 long tons by mid-1957.

Subject to Existing Lease

All proposals to lease the Louisville alcohol-butadiene facility are to be subject to the existing lease with Publicker Industries, Inc. of Philadelphia, Penn., which will expire on April 4, 1958. The new lease shall be for a term of not less than five years and not more than fifteen years from the date of termination of the existing lease.

Upon receipt of proposals, FFC will enter into negotiations for a period of not less than 30 days from October 31, with those submitting proposals. The date of termination of such negotiations will be determined by FFC and announced to all eligible bidders.

Determining Need for Labs

The General Services Administration, meanwhile, announced on September 24, that it is polling 24 Federal agencies to determine whether there is an existing need within the Federal establishment for the Government Laboratories at Akron, Ohio. The laboratories, built in 1943 and used as a pilot plant in synthetic rubber research, will then be offered for bidding at a public sale.

Franklin G. Floete, Administrator of General Services, explained that under a law passed by Congress in July of this year, GSA must offer the facility for sale, but also must first gather information as to whether there is a substantial Federal need for the laboratories for research or any other use.

When all information is in hand, he said, the General Services Administration and the Bureau of the Budget will determine whether the best interests of the United States are served by retaining the facility for use by an agency or by selling the laboratories to private industry.

The laboratories were operated until recently by the University of Akron and are now in standby condition. The legislation of last July removed the laboratories from the control of the National Science Foundation and placed the facility with GSA.

The installation consists of 14 buildings having a floor area of more than 53,000 square feet and comprising offices, shops, garage and storage area, as well as lab and pilot plant facilities. Included are nearly six acres of Government-owned land, a water treatment pond, tank farm and other improvements. Agencies being polled include the Atomic Energy Commission, Departments of Defense, Commerce, and Agriculture, and other major Government establishments.

Rubber Firms Deny Price Fixing

Six rubber companies filed motions in U. S. District Court, in Denver, Colo., on September 15, to dismiss Federal indictments charging them with violation of the Sherman Anti-Trust Act by fixing prices on industrial rubber belts. The motions contend the indictments, returned last June 1 by Colorado's U. S. Grand Jury, fail to demonstrate an offense against the government. The indictments name Gates Rubber Co., Denver, Colo., Goodyear Tire and Rubber Co., Akron, Dayton Rubber Manu- Co., Dayton, Ohio, United States Rubber Co., New York, and Boston Woven Hose and Rubber Co., Boston. Attorneys for the six corporations previously entered pleas of innocent to the charges on June 29.

Named Plioflex Sales Agent

A. Schulman, Inc., Akron, Ohio, has been named a sales agent for "Plioflex", trade name for the line of synthetic rubbers produced by the Goodyear Tire & Rubber Co. The new arrangement will make the rubbers more readily available to consumers with Schulman's sales organization supplementing Goodyear's own sales force. Founded more than 25 years ago by Alex Schulman, the rubber and plastics company has offices and warehouses in New York City, Boston, Mass., E. St. Louis, Ill., and Akron, where it has its main plant and headquarters. The firm also has offices in London, and Hanover, Germany.

SATISFACTORY MEETING HELD BY RUBBER DIVISION AT ATLANTIC CITY

Everything worked out quite smoothly at the 70th Meeting of the Division of Rubber Chemistry of the American Chemical Society, which was held at the Chalfonte-Haddon Hall Hotel in Atlantic City, N. J., from September 19 to 21. Since the meeting was held in conjunction with the 130th meeting of the parent society no separate registration figures were available, but it is estimated that the Rubber Division attracted a registration of somewhat over 1200.

The division meeting featured the presentation of 26 technical papers, including delivery of the 1956 Charles Goodyear Lecture by Dr. Sidney M. Cadwell, director of research and development of the U. S. Rubber Co., announcement of the election of new officers and directors for the 1956-57 season, a meeting of the 25-Year club, the usual business session, the Suppliers' Cooperative Cocktail Party, and the divisional banquet.

Following procedure adopted in recent years, the four sessions were roughly divided by subject matter, the first devoted to new polymers, with A. E. Juve (Goodrich), division chairman, presiding, the second to oxidation and aging, with B. S. Garvey, Jr. (Sharples Chemicals), chairman-elect, presiding, the third to carbon black and processing, with D. C. Maddy (Harwick Standard), director-at-large, presiding, and the final session to compounding and testing, with A. J. Northam (DuPont) in the chair.

Among the new polymers discussed were a new fluorine-containing elastomer developed by DuPont, some rubbery polymers and copolymers prepared with the use of complex metal catalysts, and several new types of silicone rubbers. Other papers were concerned with the friction between rubber and rough surfaces, resistance of rubber parts in jet planes to hydraulic fluids, resistance of rubber compounds to outdoor and accelerated ozone attack, the organic nature of carbon black surfaces, elasticity and break of compounded rubbers, and the influence of petroleum oils on staining and discoloration of elastomers. Abstracts of all of the papers presented were published in our August, 1956, issue.

In addition to its own program, the Rubber Division also sponsored a Symposium on the Literature of Rubber in conjunction with the ACS Division of Chemical Literature. This symposium was also held at the Chalfonte-Haddon Hall Hotel, on September 18 and 19. Details concerning the symposium wil be found elsewhere in this issue.

R. F. Dunbrook
newly-elected vice-chairman.

New Officers for 1956-57

Election of officers and directors for the 1956-57 season, selected by letter ballot as usual, was announced by Newlin Keen (DuPont) at the business session on the morning of Thursday, September 20. A total of 1336 ballots were cast.

The new officers are: *Chairman*, Benjamin S. Garvey, Jr., Laboratory Director, Sharples Chemicals Division, Pennsylvania Salt Manufacturing Co., Wayne, Penna.; *Vice-Chairman*, Raymond F. Dunbrook, Assistant Director, Research, Firestone Tire & Rubber Co., Akron, Ohio; *Secretary*, Arthur M. Neal, Assistant Director, Elastomers Laboratory, Elastomers Division, E. I. du Pont de Nemours & Co., Wilmington, Del.; *Treasurer*, George E. Popp, Manager, Domestic Sales, Rubber Chemicals Division, Phillips Chemical Co., Akron, Ohio; *Director-at-Large*, James D. D'Ianni, Assistant to Vice-President, Research and Development, Goodyear Tire & Rubber Co., Akron, Ohio.

Eight new directors from sponsored local rubber groups were elected for two-year terms, as follows: *Akron*, K. R. Garvick (Mansfield Tire); *Boston*, T. C. Edwards (Acushnet Process); *Buffalo*, Paul Sick (Hewitt-Robins); *Chicago*, Vincent LaBrecque (Victor Mfg.); *Fort Wayne*, David Sherman (U. S. Rubber); *Los Angeles*, R. E. Bitter (Goodrich Chemical); *New York*, S. M. Martin, Jr. (Thiokol Chemical); *Canada*, N. S. Grace (Dunlop Research Center). For the first time, the Executive Committee includes a fully-elected director from Canada.

Cadwell Delivers Goodyear Lecture

In his paper on "Scientific Contributions to the Rubber Industry," Dr. Cadwell recalled the early discussions that led to the founding of *Rubber Chemistry and Technology*. It is gratifying, he said, to see the place it has come to occupy in the field of technical literature. The A. C. S. monograph on the "Chemistry and Technology of Rubber" was another milestone in the development of the scientific side of the rubber industry, the Goodyear Medalist declared.

Rubber science, the speaker stated, has progressed to the point where it covers almost the whole spectrum of scientific activity. The broad range of the technical side of the rubber industry is indicated, in part, by the standing of the rubber industry as a purchaser of products from the chemical and allied industries. Dr. Cadwell noted that in a recent study, the rubber industry was among the top six of thirty-six industries making purchases from the chemical and allied industries. Observing that this study covered the year 1947, he estimated that the relative position of the rubber industry today would be even better.

The Goodyear Medalist stated that one may measure the importance of technical

B. S. Garvey, Jr.
elected division chairman.

contributions to an industry by the rate of growth of that industry. Between the years of 1930 and 1955, the rubber industry had a growth rate of over 5% per year, he reported. The rubber industry, he declared, has grown because it has been able to meet its many technical challenges and has been able to make use of the latest scientific advances to do so.

In the next portion of his address, Dr. Cadwell discussed some of the technical challenges which have confronted the rubber industry through the years. He first discussed the original raw rubbers and the early work done on the preservation and application of latex. He then considered the many different chemicals which have been developed to facilitate the processing of rubber and the manufacture of products.

The speaker also discussed the early problems involved in the use of textiles in the rubber industry, paying particular attention to tire cord. He also touched upon the synthetic rubber industry as it exists today, and discussed those plastics which find a place in rubber technology.

Dr. Cadwell sees the future as presenting an enormous challenge. The growth of automation, for example, could change the whole pattern of the rubber industry, he pointed out. The scientific part of the rubber industry, he declared, is one of the

A. M. Neal
re-elected secretary.

most exciting and productive areas in all American industry. The future of the rubber industry will continue to be determined by how well the challenges of the future are met, he concluded. (EDITOR'S NOTE: A full biography of Dr. Cadwell was published in the June, 1956, issue of RUBBER AGE.)

Business Session Is Held

The divisional business meeting was held on Thursday morning, September 20, with Chairman Juve presiding. The first order of business was a minute's silence in memory of three members who passed away since the last meeting. These were: William Y. Duncan, Jr. (retired), Ralph E. Hughes (Goodyear), and Robert L. Randall (Midwest Rubber Reclaiming).

The chairman then revealed that the Executive Committee had approved a recommendation of the New Publications Committee, which is headed by Norman Bekkedahl (Bureau of Standards), that a uniform lecture book be compiled from all of the various lectures sponsored by local rubber groups throughout the country. He also stated that Dr. Maurice Morton, of the University of Akron, has been named to edit this book.

(EDITOR'S NOTE: It is understood that the lecture book, which will be a composite of the various lectures mentioned above, will be underwritten by the Rubber Division. When published, copies of the book will be sold to the various local rubber groups for resale to the students taking the non-credit lecture courses. It is strictly a non-profit venture where the Division is concerned and is being done in the interests of all concerned. The lecture book is expected to be available in about one year.)

Dr. Juve also advised that the Executive Committee had approved, and provided funds for, a fifth edition of *Rubber Chemistry and Technology*. This fifth edition will consist of review papers, either original or reproductions, and will be edited by David Craig (Goodrich Research Center). Dr. Craig will be assisted by an Editorial Board including the following: Norman Bekkedahl (Bureau of Standards), G. S. Whitby (University of Akron), R. F. Dunbrook (Firestone), C. C. Davis (Boston Woven Hose), S. D. Gehman (Goodyear) and W. R. Smith (Cabot).

(EDITOR'S NOTE: The special or fifth edition of *Rubber Chemistry and Technology* wil be known as "Rubber Reviews" and plans are already under way for publication of the first issue late in 1957. Among some of the review material being considered are those covering the state of technology of natural rubber, chemistry of isocyanates, crystallization of rubber, hardness testing, determination of sulfur, and safety in the rubber plant.)

H. W. Hoerauf (U. S. Rubber), chairman of the Membership Committee, reported that a 7½% gain in membership had been recorded over last year. As of September 1, 1956, there were 2490 regular and 576 associate members. Total membership, including non-member subscribers to *Rubber Chemistry and Technology*, amounted to 3819. Regular and associate memberships are at an all-time high.

Chairman Juve announced that O. R. Huggenberger (Dominion Rubber) would act as chairman of the Local Arrangements Committee for the next meeting, to be held at the Sheraton-Mount Royal Hotel in Montreal, Canada, May 15-17, 1957, and Henry Peters (Bell Telephone Laboratories) in a similar capacity for the Fall Meeting, to be held at the Commodore Hotel in New York City on September 11-13, 1957. He also announced that plans were under way for an International Rubber Meeting in Washington, D. C., in the Fall of 1959.

Arthur E. Juve (right), retiring chairman of the Division of Rubber Chemistry, A.C.S., is shown here presenting the Charles Goodyear Medal to Dr. S. M. Cadwell

(EDITOR'S NOTE: Plans for the 1959 International Meeting are ambitious in nature. It is expected that A. S. T. M. Committee D-11 may sponsor the first day, the A. S. M. E. Rubber & Plastics Division the second day, while the last three days will be the regular Rubber Division meeting. ISO Technical Committee 45 on Rubber is being invited to hold their 1959 meeting in the United States, either before or after the five-day International Meeting. Tentative approval to these plans has been given by both A. S. T. M. and A. S. M. E. representatives, but final decision rests with the Executive Committees and society officials of both groups.)

Before concluding the business session, Dr. Juve introduced H. G. Dawson, Research Laboratories, Firestone Tire & Rubber Co., whose paper on "A Zinc Oxide Viscosity Test for Hevea Latex," which was presented at the Cleveland meeting last May, won the "Best Paper Award." A similar award will be announced for the Atlantic City meeting shortly.

Divisional Banquet Attracts 630

Approximately 630 members and guests attended the divisional banquet, held in the Carolina Room of the Chalfonte Hotel on Thursday evening, September 20. In addition to an excellent dinner, the banquet featured the presentation of the Charles Goodyear Medal to Dr. Cadwell and wound up with a variety show of good taste and quality.

In his introductory remarks at the banquet, Chairman Juve remarked that although Atlantic City marked the 70th meeting of the Rubber Division, the Division was actually 37 years old, the initial meeting having been held in September, 1919. The discrepancy is due to the fact that several meetings were omitted during the war period while in some years three full meetings were held.

Dr. Juve also indicated that membership in the Division was at an all-time high, with 232 new regular and associate members having joined the ranks during the past year. He introduced all of the members and guests seated at the large dais, including Alden Emery, genial secretary of the American Chemical Society, who told a story or two. He then turned the proceedings over to John P. Coe, retired executive of the U. S. Rubber Co., who discussed "Sidney M. Cadwell—The Man and His Accomplishments."

In tracing Dr. Cadwell's career, Mr. Coe told of his early family life, during which he resided in Hawaii, Japan, Washington, California and, finally, New York. He revealed that the Goodyear Medalist worked his way through college and served with the Chemical Warfare Service during World War I, being honorably discharged with the rank of captain.

Mr. Coe was associated with the General Laboratories of the U. S. Rubber Co., then located in New York City, when Dr. Cadwell joined the Laboratories in 1921. Another well-known technologist with the Laboratories at the time was E. B. "Curley" Curtis, now retired from the R. T. Vanderbilt Co. Between the two of them, according to Mr. Coe, they gave the new chemist a hard time before he was fully accepted as a member of the fold. The speaker detailed several anecdotes relating to the Coe-Curtis-Cadwell trio, particularly with regard to the so-called "Cadwell Chemicals."

Mr. Coe also traced some of the outstanding chemical achievements of Dr. Cadwell, including his work with complementary accelerators, ammonia and balata cures, VGB antioxidants and, subsequently, the Geer-Cadwell golf cover and numerous developments in the tire field, including

James D. D'Ianni
new director-at-large

George E. Popp
re-elected division treasurer.

adoption of synthetic rubber in tires and the promotion of the use of nylon. He also told of his work during World War II on self-sealing fuel tanks.

The speaker then turned to the personal life of the Medalist. He stated that Dr. Cadwell has two married daughters and five grandchildren, still enjoys playing both tennis and golf, is an elder of his church, and has served both as president of a P. T. A. group and as a member of a local school board. In presenting him for the award, Mr. Coe referred to Dr. Cadwell as "Mr. Rubber Chemist."

Presentation of the Medalist was made by John M. Ball (Midwest Rubber Reclaiming) and the Goodyear Medal, scroll and honorarium were conferred by Chairman Juve. In his acceptance, Dr. Cadwell thanked the Rubber Division for his selection and read off the names of many people associated with U. S. Rubber who had helped him throughout his career with the company.

Incidentally, an excellent "selling" job for the Joint Conference of the ACS Rubber Division and the CIC Rubber Chemistry Division, scheduled for Montreal, Canada, next May, was done at the banquet on the part of the Canadian group. Not only was a printed "invitation" placed at every setting, but a beautifully-colored, picturesque book of Canada was located at every table.

The Suppliers' Cooperative Cocktail Party, which is held only once a year, preceded the banquet. It was held in the Chalfonte Lounge and attracted a capacity crowd. Although no official figures are kept, it is estimated that more than one thousand members and guests, with their wives and ladies, attended the party. Approximately 110 suppliers furnished contributions to make the party possible.

C. A. Bartle (DuPont) served as chairman of the Suppliers' Cooperative Cocktail Party Committee, and did an excellent job. Other committee members included C. M. Baldwin (United Carbon), A. I. Brandt (Goodrich Chemical), O. J. Brown, Jr. (Cabot), P. G. Connell, Jr. (American Cyanamid), C. O. Davidson (Columbian Carbon), A. H. Eufer (Vanderbilt), W. J. Geldard (Naugatuck Chemical), J. H. Nesbit (National Polychemicals), and B. R. Silver (N. J. Zinc).

25-Year Club Holds Meeting

As usual, activities at the meeting got underway with a luncheon-meeting of the 25-Year Club, with Ernest Bridgwater (DuPont) presiding as chairman. Approximately 170 members and guests were present, including Dr. J. T. Watts, Manager, Rubber Service Department, Imperial Chemical Industries, Ltd., of England. Mr. Bridgwater made the point that membership in the 25-Year Club now represented between 14 and 15% of total Division membership.

The chairman paid special tribute to the memory of Philip L. "Judge" Wormley, for many years associated with the National Bureau of Standards at Washington, D. C., who passed away a few months ago. Several new members were introduced at the meeting, including J. A. Scellen (Pequanoc Rubber), Ralph W. McCreary (McCreary Tire) and Philip M. Earhart (Gates Rubber).

In accordance with procedure, an elimination contest was held to determine the member present with the longest record of service in the industry, barring those having previously been so selected. Top honor went to Clinton H. Schultz, chief chemist of The F. G. Schenuit Rubber Co., Baltimore, Md., who has had 46 years of service. The usual money clip memento was presented.

Mr. Schultz started his activities in the rubber field in 1910 as a laboratory chemist for the Goodyear Tire & Rubber Co. Subsequently he started a business of his own making rubberized window shades and other products, this business being acquired by the Seiberling Rubber Co. in 1924. Late in 1927 Mr. Schultz joined the Holtite Manufacturing Co., remaining with that company until 1939. After a period of approximately eight years during which he acted as a technical sales representative for the Standard Limestone Co., Mr. Schultz joined the Schenuit organization as chief chemist in 1947. Incidentally, although he has been a member of the 25-Year Club for some time, this was actually the first luncheon-meeting of the club, Mr. Schultz has attended.

In concluding the meeting, Chairman Bridgwater announced that N. S. Grace (Dunlop Research Center) will function as chairman at the meeting of the club in Montreal next spring, and W. O. Hamister (Naugatuck Chemical) would perform a similar function at the meeting in the fall. The Atlantic City session was the 17th luncheon-meeting held by the club.

Local Arrangements Well Handled

As indicated, all activities at the Atlantic City meeting moved along smoothly, and full credit is due to the Local Arrangements Committee. This committee was headed by A. J. Northam (DuPont) as chairman with T. K. Cox (Western Electric) as vice-chairman. T. W. Gorman (Quaker Rubber) functioned as chairman of the banquet committee, while other committee members included T. W. Elkin (Vanderbilt), J. B. Johnson (Linear) and D. B. Forman (DuPont).

OTS Silicone Rubber Studies

The Office of Technical Services, U. S. Department of Commerce, has released two research reports dealing with silicone rubber. The first of the studies is entitled *Testing of Silicone Rubber at Elevated Temperatures* (PB 121192) and was written by A. J. DeFrancesco, Connecticut Hard Rubber Co. for Wright Air Development Center, U. S. Air Force. The 41 page booklet sells for $1.25. It discusses an apparatus to measure physical properties of silicone rubber in temperatures to 400°F. The second report, *Room-Temperature-Vulcanizing Silicone Adhesive* (PB 121209), by the same author, is a 69 page booklet selling for $1.75. This report describes a search for a new method or adhesive which would bond rubber to aircraft metals and to itself without use of heat or pressure. Commercially available adhesives for this purpose are evaluated and other temperature-curing systems are analyzed. Both studies may be obtained from OTS, U. S. Department of Commerce.

SPI Plans Annual Conference

The Society of the Plastics Industry, Inc. will sponsor the 1957 Annual National Conference and Pacific Coast Plastics Exposition which will be held on March 18-21 in Los Angeles, Calif. The SPI Annual National Conference, meeting at the Hotel Biltmore, will cover plastics in the fields of electronics, aircraft and defense, packaging, building materials, appliance sheet forming, cellular plastics and the latest developments for processes and processing. The Pacific Coast Plastic Exposition, a regional trade show, will be held at the Shrine Exposition Hall. Companies in the plastic industry will exhibit their products to the growing commercial and industrial market. This will be the first time that the conference and the plastics trade show will be held in Los Angeles. The show will not be open to the public. J. Allen Carmien, president of Nupla Manufacturing Co., Los Angeles, will be general chairman.

BIG FOUR RUBBER COMPANIES SIGN SUPPLEMENTAL PAY FACTS

The four major rubber companies have signed agreements with the United Rubber Workers AFL-CIO, granting supplemental unemployment benefits (SUB) to 100,000 rubber workers in 47 plants. The four rubber companies are Firestone, Goodrich, Goodyear and U. S. Rubber. The plan is identical for each of the rubber companies with separate 30-page agreements covering details. It calls for payment by the companies of supplemental unemployment benefits of 65% of normal after-tax weekly take-home pay for a maximum of 26 weeks.

The plan will require the four rubber companies to pay into the fund an amount equal to three cents an hour for each employee covered. A union official estimated over $5,000,000 will be paid into the fund by the four rubber companies during its first year of operation. The plan will not become effective until July, 1957.

The agreement provides maximum amounts at which the rubber companies must maintain the supplemental unemployment benefit funds. At the rate of three cents an hour per employee it is expected it will take from three to four years for the maximums for each company to be reached. The fund maximums for each company are as follows: U. S. Rubber, $5,000,000, Goodyear and Firestone, $4,500,000 each, and Goodrich, $2,500,000.

As soon as the funds reach these maximums the companies are required only to maintain these amounts in the fund. The funds will be administered solely by the individual rubber companies with investment of the funds limited to U. S. Government obligations.

Supplemental Pay Feature

In states allowing integration with unemployment compensation programs, the URW plan will act as supplemental pay in the case of layoff or shortened work weeks. In other states, such as Ohio, where integration is not now permissible, the plan provides for two alternative pay methods.

One alternative method calls for a "lump sum" payment paid to the worker by his employer at the end of the layoff period. The "lump sum" would be equal to what he would have received if the state permitted integration of the SUB plan with the state's unemployment compensation program.

The other alternative, known as the "periodic method" calls for two weeks of unemployment compensation payments during layoff followed by one week of such payments. These payments would make up the difference between SUB and unemployment compensation.

An official on the URW indicated that the rubber companies have given the union "assurances" they will work for a change in Ohio laws to permit integration of supplemental unemployment benefits with jobless compensation laws. He said also the rubber companies would join forces with auto and steel companies, which also have SUB programs, in attempting to change Ohio's ruling.

L. S. Buckmaster, president of the URW, and Joseph W. Childs, union general vice-president, hailed layoff pay agreements as "an historic milestone not only for rubber workers and their union but for all the communities where rubber workers live." The negotiated plan is retroactive to July 8 this year for Goodrich and to July 15 for Firestone, Goodyear and U. S. Rubber. It will become effective for unemployment payments one year from these dates.

According to the URW announcement, the agreement provides for payment of benefits to workers on shortened work weeks as well as for layoffs. In addition, it has special safeguards to protect long seniority employes under circumstances of severe layoff. Workers in states where unemployment compensation benefits are for less than 26 weeks will now receive benefits for a full 26 weeks, the URW announcement said.

AMERICAN CYANAMID CO. APPOINTS THREE TO NEW MANAGEMENT POSTS

V. E. Wellman R. W. Daniels P. G. Connell, Jr.

Three new department managers have been appointed by the Organic Chemicals Division of the American Cyanamid Co. Dr. V. E. Wellman has been named manager of the Petrochemicals Department; R. W. Daniels has been appointed manager of the Intermediates Department, and P. G. Connell, Jr., manager of the Rubber Chemicals Department. Due to recent substantial growth in the sale of petrochemicals, Dr. Wellman, who first joined American Cyanamid in 1945, will now devote his entire time to this activity. He was formerly manager of all three departments. Dr. Wellman is a graduate of Phillips University and the University of Washington. Prior to joining American Cyanamid, he was associated with the B. F. Goodrich Co. and the R. W. Greef Co.

Mr. Daniels, who has been with the company since 1936, is a graduate chemist from Dartmouth College. Since joining the company following his graduation, he has served in all phases of developing, producing, purchasing and selling coal tar products and intermediates. Mr. Connell, a graduate of Princeton University, joined American Cyanamid in 1946 as a student trainee following three years of service with the U. S. Navy. Since that time, he has had extensive experience in both producing and selling activities.

Depatie Forms Sales Firm

F. A. Depatie, formerly sales engineer for the Rubber Products Division of the Parker Appliance Co., has announced the formation of the Depatie Fluid Power Co., manufacturers' representatives for hydraulic and pneumatic components. The new organization, operating from 18 Ridgewood, Kalamazoo, Mich., will service industry throughout western Michigan. Lines being represented initially include Parker synthetic rubber O-ring seals; S-P cylinders and power chucks; air valves made by Numatics Inc., Milford, Mich., and drill heads manufactured by Hy-Neu-Math of Milwaukee and by House Engineering of Montpelier, Ohio.

Union Carbide Acquiring Visking

Union Carbide and Carbon Co., New York, N. Y., is expanding its operations into the fields of cellulose casings and polyethylene film through the acquisition of the Visking Corp., Chicago, Ill. Under terms of the agreement, Visking stockholders will receive one share of Union Carbide for each two and one-half shares of their stock. Completion of the transaction is subject to the approval of Visking stockholders. The merger will join a major producer of polyethylene film—Visking—with a major producer of polyethylene resins—the Bakelite Co., a division of Union Carbide. Bakelite recently expanded its operations in the polyethylene plastics field. In June, the company announced plans for the construction of two new plants with a combined capacity of 55,000,000 pounds of low-pressure polyethylene a year.

SPE Plans Annual Conference

"Fifteen Years of Plastic Progress" is the theme of the 13th Annual National Technical Conference which will be held by the Society of Plastics Engineers, Inc. on January 16-18, 1957, at the Hotel Sheraton-Jefferson, St. Louis, Mo. This conference is being built around the most complete assemblage of technical papers available on the subject of plastics, and will be of value to all. Information in reference to registration may be directed to the Registration Chairman, Harold A. Holz, Bakelite Co., 122 North Kirkwood Rd., Kirkwood 22, Mo. Individual fee for SPE members is $10. Non-member fee is $15.

CENSUS BUREAU RELEASES REPORT ON SYNTHETIC RUBBER INDUSTRY

During 1954, manufacturers in the synthetic rubber industry shipped products valued at $361,000,000, an increase of 54% over 1947, according to preliminary results obtained from the 1954 Census of Manufactures conducted by the Bureau of the Census, Department of Commerce. Average employment in this industry increased 10% since 1947, when the last census was taken, to a total of 850,000 employes in 1954. Value added by manufacture in the industry amounted to $153,000,000 in 1954, an increase of 57% over 1947, the Census Bureau reports.

"Value added" is derived by subtracting the cost of materials, etc., from the value of shipments. It avoids, therefore, the duplication in the value of shipments that results from the use of products by some establishments as materials by others and is the best measure available for comparing the relative economic importance of manufacturing among industries and geographic areas.

The synthetic rubber industry represents manufacturing establishments engaged primarily in the manufacture of synthetic rubber by polymerization or copolymerization. Important products of this industry include butadiene-styrene type, butadiene-acrylonitrile type, butyl, neoprene, Thiokol, and all other vulcanizable elastomers. An elastomer for the purpose of this classification is a rubber-like material which will stretch 150% or more and return with force to approximately its original shape and position.

Establishments primarily manufacturing non-vulcanizable elastomer materials are classified in Industry 2823, "Plastics Materials." The industry classification for the synthetic rubber industry used in the 1954 Census of Manufactures is based on the *Standard Industrial Classification Manual, Volume I, Manufacturing Industries*, 1945 edition.

Value of Shipments

The value of shipments, as reported by establishments classified in the synthetic rubber industry, consisted not only of products described above as primary to the industry, but also included the value of secondary products (which are primary to other industries). The $361,000,000 total value of shipments reported by establishments classified in Industry 2824 consisted of $359,000,000 manufactured products and $2,000,000 miscellaneous receipts for research and development, sales of scrap, etc. The $359,000,000 product shipments were accounted for by $352,000,000 of synthetic (chemical) rubbers and other products primary to the industry and $7,000,000 of products primary to other industries (e.g., synthetic resins, synthetic organic and inorganic chemicals, and liquefied petroleum gases).

Thus, the industry's shipments of synthetic (chemical) rubbers represented 98% of its total manufactured product shipments (primary and secondary). This figure describes the "primary product specialization ratio," that is, the extent to which plants classified in an industry "specialize" in making products regarded as primary to the industry. The 1947 primary product specialization ratio for the industry was 96, the Census Bureau states.

The industry's total value of shipments should be clearly distinguished from the total value of primary products of the industry shipped by all producers. For the latter, $392,000,000 value of synthetic (chemical) rubbers and other products primary to Industry 2824 were shipped by all producers. Of this total, 90% was shipped by plants classified in Industry 2824, while the remainder was shipped as secondary products by plants classified in other industries. The figure 90% is known as the "coverage ratio," that is, it measures the extent to which all shipments of primary products of an industry are "covered" by plants classified in the industry, as distinguished from secondary producers elsewhere.

The general statistics (employment, payrolls, cost of materials, value of shipments, etc.) are reported for each establishment as a whole. Aggregates of such data for an industry reflect not only the primary activities of the establishments in that industry, but also their activities in the manufacture of secondary products and receipts for their other activities (contract work on materials owned by others, repair work, etc.). This fact should be taken into account in comparing industry statistics with product statistics which show the shipments by all producers of the primary products of the industry.

More detailed figures for this industry will appear later in the Census Bulletin, MC-28B, "Industrial Organic Chemicals," which will be published and offered for sale at a later date by the Superintendent of Documents, U. S. Government Printing Office. Also, in this bulletin, there will be a comprehensive discussion of such concepts as "industry," "establishment," "secondary production," as well as the various statistical items such as "employment," "value added," etc. Similar advance reports and final bulletins will be issued for other industries during the coming months.

Rib Hi Miler Truck Tire

The "Rib Hi Miler", a new five-rib truck tire, has been announced by the Goodyear Tire and Rubber Co. of Akron, Ohio. The tire has a tread design similar to the "Traction Hi Miler". It replaces Goodyear's "Hi Miler Rib" line of truck tires and features a wider, flatter tread of five-rib design that puts more rubber on the road for an estimated 10% increase in mileage and greater traction to resist skids. Rayon cord, triple-tempered by Goodyear's exclusive 3-T process of tension, temperature and time, gives the tire a more resilient body for longer life and more recappability. New type breakers provide additional body protection. Latest tread compounds offer more resistance to rib cracking and shoulder tearing and add many miles of original tire life. Sizes will be the same as the Hi Miler Rib line.

Have some comments to make? Write a letter to the editor! (See page 10.)

Studying Catalysis Mechanism

A new basic research program on the mechanism of catalysis is underway at the new Parma, Ohio, laboratories of the National Carbon Co. Although catalysts are used in the production of many products, such as synthetic rubber, gasoline, fuel oils, ammonia and textiles, they have been developed largely on an empirical, trial and error basis, company officials point out. A basic description of the behavior of catalysts is exceedingly complex and science is not now able to design catalytic agents for specific purposes. Through this study, the Parma laboratories hope to achieve a better understanding of these materials. The research will be made possible by the use of two new field emission electronic microscopes, both of which were developed only a few years ago. One of the instruments, an electron field emission microscope, can magnify up to 5,000,000 times and will be used to study the motions of atoms across catalytic-type surfaces. The other instrument, an even more powerful "ion emission" microscope which magnifies 50,000,000 times, will be used to determine exactly what molecules or atomic complexes form on specific surface sites.

Gemfoam Polyurethane Line

A complete new line of polyurethane plastic materials, called "Gemfoam," which finds use in cushioning, padding, insulation, decoration and in other industrial purposes is now available, according to the Texas Foamed Plastics Corp. of Gonzales, Texas. The new material, which is manufactured under DuPont license, can be supplied in rolls, sheets or slabs in thicknesses from ⅛ inch to 12 inches and widths up to 48 inches, with greater widths soon to be available, the company says. The line includes ten resiliencies from very soft to very firm and can be obtained in any shade of seven basic colors. Gemfoam products are very light in weight, extremely tough, durable, odorless, resistant to corrosion and oxidation, nontoxic, non-irritating and non-allergic, the company states. These materials are also said to be flame retardant and to have excellent acoustical and thermal insulating qualities.

Goodrich Peruvian Assignments

B. F. Goodrich Co., Akron, Ohio, has appointed Vincent Griffin factory manager of a new associate tire and rubber company in Lima, Peru. Mr. Griffin is a native of Canada and attended the University of British Columbia and McGill University, where he received a degree in mechanical engineering. Also assigned to the Peru plant are William Harrison Bice, as technical adviser on tire construction, and Robert J. Young, as technical adviser on tire compounding. The plant was designed by Goodrich engineers and will be completed in time for production to begin early in 1957. Peruvian interests own a major share of the plant's stock with Goodrich holding a minority interest.

RUBBER LITERATURE SYMPOSIUM HELD AT ATLANTIC CITY MEETING

A Symposium on the Literature of Rubber, held on September 18 and 19 in Atlantic City, N. J., attracted well over 100 members and guests at each of two sessions. The Symposium, co-sponsored by the Divisions of Rubber Chemistry and Chemical Literature of the American Chemical Society, preceded the 70th Annual Meeting of the Rubber Division. Thirteen interesting papers were presented at the Symposium which was presided over by Miss Hanna Friedenstein (Godfrey L. Cabot). Miss Friedenstein organized the entire Symposium and delivered brief introductory remarks preceding the sessions on Tuesday afternoon, September 18, and Wednesday morning, September 19.

Authors of the papers presented at the Symposium were guests of Godfrey L. Cabot, Inc., at a luncheon preceding the meeting. Discussion periods followed the presentation of many of the papers, indicating the high level of interest in the proceedings. There were also many requests for the bibliographies which accompanied many of the papers. The possibility exists that the entire Symposium may be published in its entirety.

Abstracts of the thirteen papers which were presented at the Symposium appeared in the August, 1956, issue of RUBBER AGE. Paper titles and their authors follow:

"The Jargon of the Rubber Industry" by S. G. Byam (DuPont).

"The Literature of Natural Rubber" by T. H. Messenger (RABRM). (Note: In Mr. Messenger's absence, his paper was read by M. E. Lerner, editor of RUBBER AGE.)

"The Literature on Synthetic Rubber" by Leora Straka (Goodyear).

"The Rubber Division Library: An Experiment in Cooperation" by Dorothy Hamlen (Akron University).

"Classification Schemes for the Literature of Rubber" by Lois W. Brock (General Tire).

"Reclaimed Rubber: A Guided Tour Through the Literature" by H. A. Winkelmann (Dryden Rubber) and J. M. Ball (Midwest Rubber Reclaiming).

"Rubber Compounding Information: Sources, Searching, Recording and Retrieval" by Kathleen S. Rostler (Rubber Formulary).

"Patent Searching in the Field of Rubber Technology" by T. A. O'Brien (Goodyear).

"Standards and Specifications for Rubber and Rubber Products" by J. J. Allen (Firestone Industrial Products).

"Government Reports on Rubber" by P. S. Greer (National Science Foundation) and James Kanegis (O. T. S.).

"Sources of Market Information on Rubber, Rubber Raw Materials, and Rubber Products" by H. N. Stevens (Goodrich Research Center).

"New Publication Plans of the Division of Rubber Chemistry" by Norman Bekkedahl (Bureau of Standards), R. G. Seaman (Rubber World) and David Craig (Goodrich Research Center).

"How Rubber Literature is Created: Preparing the Technical Paper" by M. E. Lerner (RUBBER AGE).

GOODYEAR FORMALLY OPENS NEW TIRE AND TUBE PLANT IN VENEZUELA

To meet growing consumer demand for its products and services, the Goodyear Tire & Rubber Co. has formally opened a new, modern tire and tube factory in Venezuela. The single story structure, located near the city of Valencia, was officially dedicated by board chairman P. W. Litchfield. Accompanying him to Venezuela to participate in the ceremonies were F. T. Magennis, vice-president and general manager of Goodyear Foreign Operations, Inc., and G. K. Hinshaw, vice-president and production manager. Many Venezuelan dignitaries, government officials and leading business executives also attended the official dedication.

Manufacturing operations at the new plant got underway in July and full production is planned before the end of the year. A complete range of passenger and truck tires and tubes, incorporating all of Goodyear's latest improved designs and manufacturing techniques, will be distributed in all major Venezuelan cities. In addition, a full line of hose for the oil industry will be manufactured at the installation.

Goodyear has been active in the Venezuelan market for over 40 years and the present factory site provides ample space for future expansion. Key executive personnel for the Venezuelan organization include J. N. Reese, managing director; W. E. Mitchell, sales manager; W. J. Smith, production manager and N. L. Gray, treasurer.

In addition to the new Venezuelan factory and plants in the U. S. and Canada, Goodyear's world-wide manufacturing facilities are located in Argentina, Australia, Brazil, Colombia, Cuba, Eire, England, Germany, India, Indonesia, Japan, Luxembourg, Mexico, New Zealand, Peru, Philippine Islands, South Africa and Sweden.

Enters Petrochemicals Field

Entry into the field of basic petrochemicals by Reichhold Chemicals, Inc., White Plains, N. Y., through long term contracts with the Escambia Chemical Corp., has been announced by Henry H. Reichhold. Arrangements for the multi-million dollar program making RCI a major producer of basic petrochemicals were negotiated by Theodore S. Hodgins and John W. Stevens, RCI vice-presidents, with Escambia Chemical. Mr. Reichhold described the step as another in RCI's long range vertical integration program aimed at producing supplies of basic chemicals and plastics for RCI's customers. Escambia is jointly owned by Electric Bond and Share, United Gas Corp., and National Research Corp. Escambia presently is producing ammonia, nitric acid, and ammonium nitrate near Pensacola, Florida, and polyvinyl chloride re-in will be on stream early in 1957. A new facility for the production of methanol will be located near Pensacola. Construction of this plant will begin promptly, with production scheduled for early 1958.

An index to Volume 79 of RUBBER AGE will be found on pages 175 to 178 of this issue.

Celebrates 50th Anniversary

U. S. Industrial Chemicals Co., a division of the National Distillers Products Corp. of New York, N. Y., is celebrating its fiftieth year of industrial alcohol and chemical production. Founded on October 17, 1906, the company was, at that time, primarily engaged in the production of alcohol. During World War I, the concern first undertook the manufacture of chemicals. An even greater expansion took place during the 1930's and 40's when the company entered into the production of butyl alcohol and derivatives. It was during this time that the firm made a number of advances in resin technology. Since 1951, U.S.I.'s production has diversified rapidly and plans are now under way for the construction of four new plants to produce phosphoric acid, sebacic acid monomers, zirconium sponge and titanium sponge. Polyethylene capacity is being more then doubled.

Marr Joins Judson Rubber

A. D. Marr, formerly associated with Dryden Rubber Division of the Sheller Manufacturing Corp., Chicago, Ill., has been appointed chemist and manager of product development of Judsen Rubber Works, Inc., Chicago, Ill.

HEARINGS ON GOODRICH CASE BEGUN BY FTC IN WASHINGTON

The Federal Trade Commission, on September 10, began hearings in Washington, D.C., on restraint-of-trade complaints against the B. F. Goodrich Co. and the Texas Co. in the sale of tires, batteries and accessories through retail gasoline stations. Similar complaints against the Goodyear Tire & Rubber Co., Firestone Tire & Rubber Co., Shell Oil Co. and the Atlantic Refining Co., will be heard in future weeks.

Before filing charges last January, FTC spent six years investigating so-called "over-riding" commissions—the fees paid by rubber firms to oil companies in the sale of tires, batteries and accessories through stations handling the oil company products. The rubber companies admit paying the commissions, but insist they are for legitimate sales assistance. The oil companies state they earn the commissions through their sales promotion efforts and deny coercing dealers handling their brand products.

The FTC Trial Examiner will decide whether the oil companies merely "push" the rubber company products, or whether these products are forced upon affiliated gasoline station owners. FTC attorneys say the oil companies have such power over their stations, principally because they can cancel an operator's lease.

The hearings got underway on September 10 with the marking of more than 70 letters and documents for identification. About half of these were accepted into evidence without objection from Texas or Goodrich attorneys. Observers state that judging by the exhibits to which Goodrich and Texas attorneys took objection, the companies apparently want to confine the case exclusively to the sales agreement between the two firms. FTC claims that Texas has a similar agreement with Firestone, and Goodrich has similar agreements with five other oil companies.

Though documents pertaining to the Goodrich-Texas agreement were for the most part admitted without objection, the company attorneys said they would not agree, at least at that time, to admitting the other papers. The trial examiner did not have to rule on the point of admissability on September 10, but the point is sure to come up at a later date.

Following the preliminaries of September 10, the trial examiner scheduled the next session for October 15. It is expected that officials of the Goodrich and Texas companies will be called to Washington to testify during the week of October 15.

Polymer Chemistry Lectures

"Recent Advances in the Theory and Practice of Polymer Chemistry" is the subject of a series of ten lectures reviewing basic principles and new developments now being sponsored by the New York Section of the American Chemical Society. The lecture series began on Wednesday evening, September 26, and continues on consecutive Wednesday evenings through December 5, excluding November 21. All lectures are being given at the Union Carbide & Carbon Corp. Building, 30 East 42nd St., New York, N.Y.

Russia Still Cautious

Although the economic report issued by the Soviet Union covering the first half of 1956 gave the actual physical volume of production for some 100 key items for the first time, no data on rubber or rubber products were included. The report indicated that some important industrial products are still considered too strategic to permit clear reporting of their output in absolute terms. Only percentage data were given for synthetic rubber and automobile tires, without any base stated.

Goodyear Tread Rubber Plant

A million dollar plant devoted to the production of tread rubber is to be built in Chehalis, Wash., by the Goodyear Tire & Rubber Co. Construction of the facility, twenty-second in the company's chain of domestic plants, is to begin immediately. Robert W. Jenkinson, for 25 years associated with Goodyear production operations, has been named to manage the Chehalis Division. Approximately 40 people will be hired in the Chehalis area to handle production. The plant will be a modernistic one-story steel-framed structure of cement block and glass. It will be 240 feet long and 80 feet wide, and will embrace a floor area of 22,000 square feet. Storage of finished production will cover 5,000 square feet of this area. Installation of machinery is scheduled for mid-December. Production lines are expected to be operational February 1. Equipment will include a Banbury, extruder, cushion calender, mill lines and a conveyor system.

The Chehalis plant will be the first Goodyear installation devoted entirely to the production of tread rubber. It will be the most modern of its kind in the country, company officials state. Tread rubber also is being produced by Goodyear at plants in New Bedford, Mass., Cumberland, Md., Gadsden, Ala., Muncie, Ind., and Los Angeles, Calif. Once in operation, Goodyear's Chehalis Division will distribute the majority of its production throughout the company's extensive Spokane, Seattle and Portland districts, which serve the Pacific Northwest.

Proposed Merger Abandoned

A plan to merge the Sheller Manufacturing Corp., Portland, Ind., and the Standard Products Corp., Cleveland, Ohio, has been abandoned. Boards of directors of both companies voted against reapproval of the merger agreement after further consideration of the problems involved in consolidating. The agreement originally was approved on May 30 and later endorsed by stockholders of both companies.

An index to Volume 79 of RUBBER AGE will be found on pages 175 to 178 of this issue.

SPE ISOCYANATE SYMPOSIUM TO FEATURE SEVEN PAPERS

In line with the Society of Plastics Engineers' policy to have regional conferences on highly specialized technical subjects, the Upper Midwest Section of SPE is sponsoring an "Isocyanate Symposium" on October 23 at the Curtis Hotel in Minneapolis, Minn. Both a morning and afternoon session have been scheduled and the program will consist of seven interesting papers on the subject. Each session will conclude with a question and answer period.

Cort Platt (Remington Rand-Univac) is serving as general chairman of the meeting with William Jarvey (Archer-Daniels-Midland) as program chairman. Advance registrations can be sent c/o Mrs. Luther Bolstad, 3857 Brookview Drive, Minneapolis 26, Minn. A registration fee of $3.00 has been set. The following papers have been scheduled for presentation:

"Introduction and History of Isocyanates" by C. L. Wilson, University of Notre Dame.

"New Surface Coatings Based Upon Diisocyanates" by M. E. Bailey, National Aniline Division, Allied Chemical & Dye Corp.

"Urethane Coatings and Adhesives" by George A. Hudson, Mobay Chemical Co.

"Non-Scorching Polyurethane Elastomers" by E. E. Gruber and O. C. Keplingler, General Tire & Rubber Co.

"Effects of Foaming Catalysts on Hydrolysis Aging of Urethane Foams" by Joseph Winkler, American Collo Corp.

"Use and Applications of Isocyanate Foams" by C. Bradford Muzzy, Nopco Chemical Co.

"Effects of Toluene Diisocyanate Isomer Ratios in Polyurethane Foams" by E. E. Gruber and G. T. Gmitter, General Tire & Rubber Co.

New English Styrene Plant

A new $5,000,000 plant for the production of styrene monomer has been announced by Petrochemicals, Ltd., of London, England, an associate of the Shell Chemical Co. The new plant will be located at Partington, on the Manchester Ship Canal, and is expected to be in production by 1958. A considerable part of the plant's output will go to Styrene Products, Ltd., a wholly owned subsidiary of Petrochemicals, Ltd., for the manufacture of polystyrene molding powders. The International Synthetic Rubber Co. will also draw upon the new plant for quantities of styrene for the manufacture of synthetic rubber at Fawley. Further quantities are expected to be available to industry in general.

Dipac Delayed Action Accelerator

Pennsylvania Salt Manufacturing Co., Philadelphia, Penna., has announced the addition of a new rubber chemical called "Dipac" to its line of "Sharples" brand synthetic organic chemicals and specialties. Dipac is a delayed action accelerator formulated for modern high temperature processing where maximum freedom from scorch is essential.

ALL-BUTYL PASSENGER CASING DEVELOPED BY ESSO RESEARCH

At a special press conference held in New York City on September 17, officials of the Esso Research and Engineering Co. announced the development of all-butyl rubber passenger car tires. It was pointed out that the all-butyl tires not only gave "excellent" service in laboratory and road tests, but also showed a number of important advantages over tires currently in use. They demonstrated specific safety features, immunity at atmospheric or chemical attacks which cause other rubbers to crack, considerable riding comfort, and a low noise level.

The safety aspect was demonstrated in recent tests in which cars equipped with all-butyl tires stopped much quicker than GR-S or natural rubber tires on both wet and dry pavement, the company stated. A butyl-tired auto going 60 miles per hour on wet pavement came to a halt in about 30% less distance. On a dry road, it stopped in about 20% less distance.

Of particular note, say company officials, is the fact that the new tires do not "squeal" on rounding corners. What noise they do cause is of a low frequency type, in comparison with the high frequency sound emitted by GR-S or natural rubber tires. Instrument recordings show the butyl tire noise level to be 15 decibels lower.

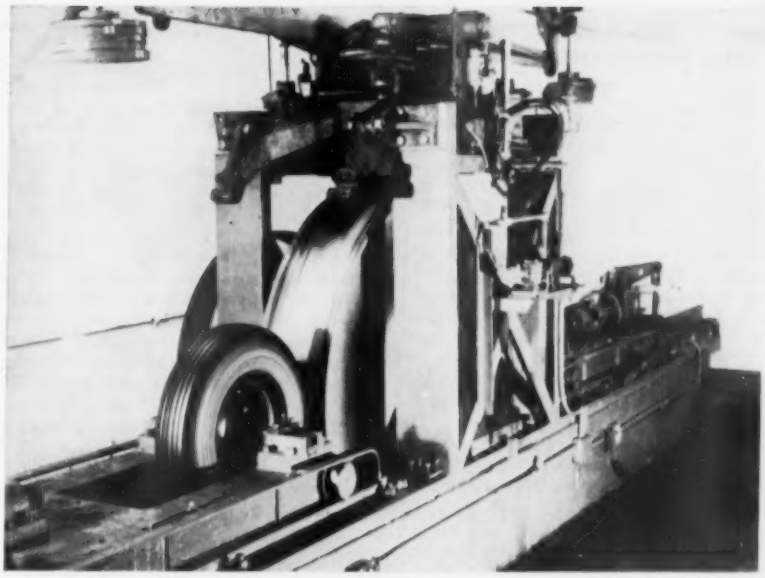
The company credited much of the tire development to date to the perfection of a butyl latex. This permitted for the first time the bonding of butyl rubber with tire cord, on existing plant equipment.

The company reported that it had been experimenting with butyl for use in tires for more than five years in every known laboratory and field test. The firm states that it is continuing the research both in its own laboratories and in cooperation with tire manufacturers.

Esso Research is operating a pilot plant at the Armstrong Tire Co., West Haven, Conn. There, all butyl tires are being processed, built and cured using regular production methods and equipment. Certain tests are also being conducted at Armstrong and the results of this work are then made available to all tire firms.

Esso Research spokesmen stress that they have no knowledge as to when commercial production and marketing of the tires will take place. An affiliated firm, Esso Standard Oil Co., is, however, developing plans for test marketing a limited number of the all-butyl tires in about six months. This program calls for the production of about 100 tires per day.

In addition to its potential in passenger car tires, the company said butyl was proving outstanding for tractor tires and other off-the-road equipment. Butyl's resistance to the elements is said to make it ideal in this field.



Shown here is a portion of the pilot plant operated by Esso Research at the Armstrong Tire Co., West Haven, Conn. Here, experimental all-butyl tires are processed, built and cured.

Constructing Urethane Plant

Hewitt-Robins, Inc., has announced the beginning of construction of its new 100,000 square foot plant at Franklin, N. J., for the manufacture of urethane foam. The plant will also house the company's research laboratory for foam and flooring products. The new facility is scheduled for completion late this year.

Goodrich Research Appointments

B. F. Goodrich Co. Research Center, Brecksville, Ohio, has announced several new staff appointments. Robert F. T. Sterbenz, a recent graduate of Case Institute with a B. S. degree in chemical engineering, has joined the Research Center staff as a junior technical man. Michael J. Geregach, formerly associated with the Koppers Co., has also joined the research staff as a junior technical man. Edward J. Mendyka, who is a 1956 graduate of Adelbert College with a B. A. in chemistry, has joined the Research Center as a chemist. Mrs. Goldie W. Rimson has been named a chemical librarian at the Research Center and Arthur T. Schooley, associated with Goodrich since 1954, has been named a technical man at the Center. Jerrold A. Glantz, a recent graduate of Western Reserve University with a B. A. degree in chemistry, has been named a junior technical man at the Research Center.

New Water Base Adhesive

A new water base adhesive which permits lamination and assembly of certain diverse materials previously not practical with other adhesives has been announced by the Bond Adhesives Co., Brooklyn, N. Y. Chief ingredient of the new product is Chemigum latex which permits a nonflammable type of adhesive. In addition, the new bonding material has exceptional resistance to humidity, and even under high humidity conditions maintains its tenacious grip. Clarity and flexibility also are outstanding characteristics attributed to the material. Specific uses already developed for the new adhesive are laminating, stenciling and silk screen work for decorative purposes. It makes possible the laminating of practically all fabrics to vinyl or acetate without wrinkling the surfaces.

International Ozone Conference

The first International Ozone Conference to be held in the United States will take place on November 28-30 at the Sheraton Hotel in Chicago, Ill. The National Science Foundation is cooperating with Armour Research Foundation of the Illinois Institute of Technology and other American sponsors in bringing seventeen scientists from eight foreign countries to be among the 52 leaders in ozone research who will present papers on fundamental and applied chemistry of ozone. Countries represented will be Germany, Switzerland, France, England, Japan, Holland, India and Argentina. American participants in the conference will represent a broad range of organizations concerned with developments in ozone research, including colleges and universities, research institutions, industrial concerns and national and city government. Industrial applications of ozone, both current and potential, will be discussed. Further information concerning the conference may be obtained by writing Sidney Mittler, Armour Research Foundation, 10 W. 35th St., Chicago 16.

Appointed Chief Engineer

Appointment of Richard R. Kesti as chief engineer of the Valvair Corp. and the Sinclair-Collins Valve Co., both of Akron, Ohio, has been announced by W. F. Krupse, Valvair executive vice-president. In his new post, Mr. Kesti will head the general engineering divisions of Valvair and Sinclair-Collins. A mechanical engineering graduate of Michigan College of Mining and Technology, Mr. Kesti formerly served for 3 years as group engineer in charge of missile valve and control component design and development for the Chrysler Corp. His experience also includes 2 years as a design engineer in the Missile Valve and Control Component Section of Redstone Arsenal, Huntsville, Ala.

HARVEY FIRESTONE PREDICTS 52% CONSUMPTION RISE BY '65

Harvey S. Firestone, Jr., chairman of the board of the Firestone Tire & Rubber Co., estimates that world rubber consumption in 1965 will be 52% higher than in the record-breaking year of 1955. Mr. Firestone, speaking in Los Angeles at the opening of a five-day series of meetings, conferences and tours by the company's board of directors, estimated that world rubber consumption in 1960 will approximate 3,600,000 tons and 4,400,000 tons in 1965. World consumption in 1955 totaled 2,980,000 long tons.

With such an anticipated increase, Mr. Firestone said, plans to expand production "must be put into effect now." He pointed out that his company has already taken several steps in this direction. Among these steps were the purchase of the synthetic plants in Lake Charles, La., and Akron, Ohio, development of rubber plantations in Brazil and the Philippines and the start of a replanting program on the company's Liberia plantation.

Mr. Firestone noted that truck and automobile production is expected to drop 21% this year from last year's record figure. But he said car and truck use is still increasing. And by 1960 the company expects 72,000,000 or 73,000,000 cars and trucks to be in use, compared to 56,000,000 in 1955.

He said replacement passenger tire sales this year will nearly reach 52,000,000, 3% above the 1955 total. Total tire shipments this year will be about 103,000,000, Mr. Firestone estimated, or about 9% below 1955. He said, "there is a distant possibility that by 1957 tire shipments will match the record of 1955."

"In the meantime," he continued, "the demand for other rubber products is constantly increasing." Mr. Firestone pointed to increases in auto registrations, outlays for highway constructions, incomes and population.

These factors, he said, "combined with the present outlook for the continued growth of the American economy generally give us the basis for a very optimistic view of the rubber industry's future." "There is going to be a time," he concluded, "and that time is not too far away, when the automobile industry is going to produce and sell more than 9,000,000 cars and trucks—more than in 1955. Tire sales will then be boosted accordingly."

Announces Subsidiary Status

American Fabricators of 22 West 21st St., New York 10, N. Y., announces that it is now a subsidiary of Accurate Steel Rule Die Manufacturers, of the same address. American Fabricators has been known to the trade for the past quarter of a century. The company specializes in the manufacture of all-steel cutting dies for cutting rubber parts of all kinds. American Fabricators manufactures both dies for machine use as well as mallet handle dies for hand use. A recent expansion of plant facilities will now enable American Fabricators to increase its service to the rubber industry.

Standard Industries Reports

The long-delayed annual report for the year ended April 30, 1956, of Standard Industries, Inc., New York, N.Y., a company in which Sydney L. Albert until recently held a major interest, offers some clarification of the current position of Seiberling Latex Products. The Standard Industries report states that Seiberling Latex was acquired from the Bellanca Corp. in October, 1955. Mr. Albert is president of Bellanca. Seiberling Latex Products, with a plant at New Bremen, Ohio, is now being operated as a division of Standard Industries. Mr. Albert's connection with Standard came to public notice in mid-June. At that time, his share holdings in several companies were sold and among these was a 415,432 share interest in Standard Industries. The company has 1,860,281 shares outstanding.

Plastic Coating Preserves Tires

The Army Chemical Corps has introduced a new method of preserving tires in storage in which the tires are protected with a coating of a liquid plastic made with an aluminum pigment. The olive drab material can be painted or sprayed, dries rapidly and can be stripped from the tire like a banana peel at any time, the Chemical Corps states. The strippable preservative permits outdoor storage for five years and enables the Army to maintain its tires in perfect condition on a stand-by basis for any emergency.

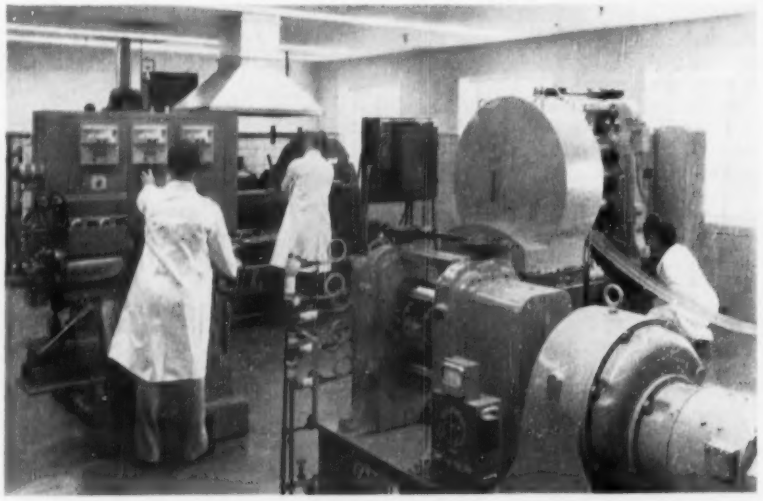
Trailer Tire-Rim-Wheel Unit

A tubeless tire, wheel and brake assembly designed by the Goodyear Tire & Rubber Co., Akron, Ohio, for use in mobile home construction, has trimmed over-all tire diameter an approximate four inches without affecting load capacity. Because of the new design approach, over-all diameter of the assembly has been lowered without a corresponding reduction in brake size. According to the company, this development means greater stability for mobile homes, and it ends the need for wheel wells which have placed definite limitations upon mobile home interior layouts. The new tire and wheel assembly, free of wheel wells, permit the use of 12-inch electric brakes and sturdy truck-type spoke wheels. The brake drum is nested in the wheel. Increased bearing capacity of the wheel enables the axle to carry loads up to 5,000 pounds, the company reports. The 7-14.5 and 8-14.5 tubeless mobile home tires are made of Goodyear's 3-T cord construction. A 6.00 by 14.5 rim has been designed for the tires. Outside diameter of the 7-14.5 mobile home tire is 26.35 inches, and carrying capacity is 2,180 pounds per tire.

Goodrich Chemical Moves

The headquarters of the B. F. Goodrich Chemical Co., formerly located at 324 Rose Building, Cleveland 15, Ohio, have now been moved to 3135 Euclid Avenue, Cleveland 15. The new telephone number is Utah 1-8200.

ENJAY EXPANDS RESEARCH FACILITIES WITH NEW POLYMER LABORATORY



Enjay Co., Inc., at special open house ceremonies on September 18, unveiled its new Polymer Laboratory at Linden, N. J. The new laboratory more than doubles the size of the company's sales technical service facilities at Linden. The Polymer Laboratory is equipped with the newest and most advanced facilities in the field of rubber technology, according to company officials. Most of the laboratory's program will be devoted to applications-research work on butyl rubber. The laboratory has twenty-four major pieces of equipment, plus another score of testing devices. In one testing apparatus, an ozone chamber, Enjay researchers can not only duplicate atmospheric conditions to be found anywhere in the world, they can exaggerate them as desired for testing purposes. A raw rubber material can enter from the laboratory's loading platform and emerge as a finished product—and the equipment is such that it can process any quantity from a few hundred grams to several hundred pounds. Shown above is one area of the new laboratory in which can be seen a mill, a calender and an extruder, as well as other pieces of miscellaneous equipment.

FORM SOUTHERN RUBBER GROUP; GARVEY AND LERNER TO SPEAK

In recognition of the fact that a large number of rubber plants are now located in the South, initial steps have been taken for the organization of a Southern Rubber Group. The new group will hold its first organizational meeting on November 16 and 17 at the Jung Hotel, New Orleans, La. The meeting will be open to all who are interested in the rubber industry.

One of the first items on the agenda during the meeting will be an election of officers. Ed Kiel (Goodyear-Gadsden) has been appointed chairman of the Nominating Committee and any suggestions for officers should be referred to him in advance of the meeting. The meeting will get underway on Friday, November 16 at 1:00 P.M. for registration. The organizational meeting will begin at 3:30 P.M.

During the organizational meeting, Dr. B. S. Garvey, Jr. (Sharples Chemicals), newly-elected chairman of the Division of Rubber Chemistry, A.C.S., will offer an address. A supplier's cocktail party will begin at 6:00 P.M. and a banquet has been scheduled to begin at 7:30 P.M. M. E. Lerner, editor of RUBBER AGE, will be the principal speaker at the banquet. He will address the group on "This Rubber Industry of Ours."

Two panel discussions have been scheduled for November 17. Beginning at 9:30 A.M., there will be a panel on "Compound Design". This will include not only compounding, but the use of production equipment and methods. In the afternoon, beginning at 1:30 P.M., a second panel discussion will be held, this one on "Elastomers for Specific Applications." Able members of the industry have been selected for both panels, and the industry is now being polled for questions to be discussed during the panels. The Program Committee for the meeting includes: J. M. Bolt (Naugatuck Chemical), E. H. Ruch (Firestone), and E. B. Pfau, with Mr. Bolt serving as chairman.

Other chairman of various activities are: *Housing*, J. R. Galloway (DuPont); *Constitution and By-Laws*, Monroe Mirsky (Guiberson). H. Connell (Armstrong Tire) and R. W. Rice (Firestone) are also serving on committees contributing to the organizational meeting. E. J. Strube (DuPont) is serving as publicity chairman.

It should be noted that hotel reservations for the meeting can be obtained by writing to the Jung Hotel, New Orleans, La., and mentioning the Southern Rubber Group. There will be a small registration fee to cover the cost of the meeting.

Appointed Special Consultant

Clem D. Easly has been appointed special consultant to the rubber and plastics industries by the Cadillac Employment Agency, Inc. of Chicago, Ill. With more than 35 years of experience in the rubber manufacturing business, Mr. Easly has served as chairman of the Molded, Lathe Cut and Extruded Division of the Rubber Manufacturers Association and as industry advisor to the Office of Price Administration, Washington, D. C.

Coming Events in the Rubber Industry

Oct. 25. So. Ohio Rubber Group, Fall Technical Meeting, Engineers' Club of Dayton, Dayton, Ohio.

Oct. 26. Akron Rubber Group, Mayflower Hotel, Akron, Ohio.

Oct. 26. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

Nov. 2. Chicago Rubber Group, Furniture Mart, Chicago, Ill.

Nov. 8. No. California Rubber Group.

Nov. 8. Rhode Island Rubber Club, Fall Meeting, Pawtucket Country Club, Pawtucket, R. I.

Nov. 14. No. California Rubber Group.

Nov. 16. Connecticut Rubber Group.

Nov. 16-17. Southern Rubber Group, Organizational Meeting, Jung Hotel, New Orleans, La.

Dec. 4-5. Society of the Plastics Industry, Seventh Film, Sheeting and Coated Fabrics Division Conference, Commodore Hotel, New York, N. Y.

Dec. 5. Buffalo Rubber Group, Xmas Party.

Dec. 6. Fort Wayne Rubber & Plastics Group, Hotel Van Orman, Fort Wayne, Ind.

Dec. 7. Detroit Rubber & Plastics Group, Xmas Party, Sheraton-Cadillac Hotel, Detroit, Mich.

Dec. 7. No. California Rubber Group, Xmas Party, Orinda Country Club.

Dec. 14. Boston Rubber Group, Xmas Party, Hotel Somerset, Boston, Mass.

Dec. 14. New York Rubber Group, Xmas Party, Henry Hudson Hotel, New York, N. Y.

Dec. 15. So. Ohio Rubber Group, Xmas Party.

Dec. 21. Chicago Rubber Group, Xmas Party, Morrison Hotel, Chicago, Ill.

Jan. 25, 1957. Akron Rubber Group, Mayflower Hotel, Akron, Ohio.

Jan. 25, 1957. Philadelphia Rubber Group, Poor Richard Club, Philadelphia, Penna.

Feb. 15, 1957. Chicago Rubber Group, Furniture Mart, Chicago, Ill.

Mar. 15, 1957. Chicago Rubber Group, Furniture Mart, Chicago, Ill.

Mar. 18-21, 1957. Society of the Plastics Industry, Annual National Conference, Los Angeles-Biltmore Hotel, Los Angeles, Calif.

Apr. 5, 1957. Akron Rubber Group, Spring Meeting, Mayflower Hotel, Akron, Ohio.

Apr. 26, 1957. Chicago Rubber Group, Furniture Mart, Chicago, Ill.

May 15-17, 1957. Division of Rubber Chemistry, A.C.S., Joint Meeting with Rubber Chemistry Division of C.I.C., Sheraton-Mount Royal Hotel, Montreal, Que., Canada.

June 7, 8, 9, 1957. Los Angeles Rubber Group, Summer Outing, Sahara Hotel, Las Vegas, Nevada.

June 21, 1957. Akron Rubber Group, Summer Outing.

Sept. 11-13, 1957. Division of Rubber Chemistry, A.C.S., Fall Meeting, Hotel Commodore, New York, N. Y.

Oct. 25, 1957. Akron Rubber Group, Fall Meeting, Mayflower Hotel, Akron, Ohio.

Jan. 24, 1958. Akron Rubber Group, Winter Meeting, Mayflower Hotel, Akron, Ohio.

Apr. 11, 1958. Akron Rubber Group, Spring Meeting, Mayflower Hotel, Akron, Ohio.

May 14-16, 1958. Division of Rubber Chemistry, A.C.S., Spring Meeting, Netherlands Plaza Hotel, Cincinnati, Ohio.

June 20, 1958. Akron Rubber Group, Summer Outing.

Names in the News

ERNEST SCHLEUSENER, formerly vice-president of manufacturing for the Mueller Brass Co., Port Huron, Mich., has been elected vice president, treasurer and a director of the Rodney Hunt Machine Co.

HOWARD C. RAPP, for many years affiliated with the Belden Manufacturing Co. at Richmond, Indiana, has joined the Sequoia Process Corp. in Redwood City, Calif., manufacturers of plastic-coated wire.

WILLIAM F. SULLIVAN, formerly staff superintendent in the Akron tire plant of the B. F. Goodrich Co., has joined the staff of Industria Columbiana de Llantas, associate plant of the International B. F. Goodrich Co. at Bogota, Colombia.

CARROLL P. KRUPP, formerly manager of new products development in the B. F. Goodrich Industrial Products Co., has been named manager of products development in the Aviation Products Division of the B. F. Goodrich Co.

WILLIAM P. HEMP, formerly merchandising supervisor of the International Division of the Minnesota Mining and Manufacturing Co., has been promoted to assistant sales manager of tape products.

EDWIN J. LEWIS and WILLIAM H. CAMPBELL have been appointed to the replacement tire sales division of the B. F. Goodrich Tire Co. Mr. Lewis, formerly manager of passenger car tire sales, will be manager of merchandising and Mr. Campbell, former manager of the truck tire sales department, will become manager of tire sales.

WILLIAM C. WILEY, who has been active in the plastics field for 15 years, has been named to head a new market development program for the Polyco-Monomer Department of the Chemical Division of the Borden Co.

EDMUND C. NAGLE, sales manager of manufacturers' products of U. S. Rubber Co. since 1954, has been appointed manager of automotive sales for the Footwear and General Products Division.

N. DUDLEY STEELE has been promoted to general production superintendent of carbon black for the Southwestern Division of the Cabot Carbon Co. Prior to his new appointment, he was assistant general production superintendent.

HARRY N. ROBERTS, formerly manager of petroleum company tire sales, has been appointed manager of dealer sales for replacement tire sales of the B. F. Goodrich Tire Co.

JOHN ZACHIRCHUK, formerly associated with the Heveatex Corp., has joined the Lloyd Manufacturing Co., Warwick, R. I., as chief latex chemist.

BENTLEY G. MCCLOUD, JR., vice-president of the First National Bank of Chicago, has been elected to the board of directors of the Dayton Rubber Co. to fill the vacancy created by the death of his father, BENTLEY MCCLOUD, SR.

HENRY C. HEINE has been appointed to the newly-created post of merchandise manager of industrial products for Hewitt-Robins, Inc. Mr. Heine has been working on special assignments for Hewitt-Robins executive offices since 1954.

CHARLES H. KANAVEL, previously western zone manager, aeronautical sales, has been appointed field sales manager for B. F. Goodrich Aviation Products, a division of the B. F. Goodrich Co.

FREDERICK S. MARKS, SR., treasurer of the Rome Cable Corp., Rome, N. Y., has been elected a director of the company.

HOWARD W. HARDING, has been elected treasurer of the Avon Sole Co., Avon, Mass. Mr. Harding has been a vice-president, sales manager and has been on the board of directors for 20 years. SIDNEY R. MILLER and WALTER A. FORBUSH, JR. have been elected to the board of directors.

MARK L. FELBER, since 1941 editor of the Wingfoot Clan, weekly newspaper of the Goodyear Tire and Rubber Co., has retired. He had been associated with the company since 1929.

G. G. ZIMMERMAN, eastern zone manager of aeronautical sales for the B. F. Goodrich Co. since 1954, has been promoted to manager of tires, airlines and distributors for the same company.

DR. NORMAN O. V. SONNTAG has been appointed to the research staff of Emery Industries, Inc. Dr. Sonntag was formerly chief chemist for the Chemical Division of the Celanese Corp. of America.

W. W. THIES, previously an industrial engineer in the General Engineering Department of the Firestone Tire and Rubber Co., has been promoted to manager of the Tire Production Planning Department.

GEORGE F. POLZER, formerly associated with the American Cyanamid Co., has been appointed to the newly-created position of purchasing director for the Witco Chemical Co.

C. HERMAN BEHRLE, formerly assistant manager of passenger tire sales, has been named manager of passenger tire sales for the B. F. Goodrich Tire Co.

DR. DAVID M. FRENCH, formerly associated with the Acme Backing Corp., has joined the Research and Engineering Division of the Wyandotte Chemicals Corp., where he will be engaged in polymer research.

ROY T. HURLEY, chairman and president of the Curtiss Wright Corp., and Richard K. Paynter, Jr., executive vice-president of the New York Life Insurance Co., have been elected directors of the General Cable Corp.

DR. CARROLL A. HOCHWALT, vice-president for research, development and engineering of the Monsanto Chemical Co., has been named winner of the 1956 Midwest Award of the St. Louis Section, American Chemical Society.

CHARLES E. GRANT, associated with the Columbia-Southern Chemical Corp. since 1955, has been appointed to the newly-created position of manager of solvent sales.

FREDERICK A. RIEHL will succeed DONALD E. BISGROVE as technical representative for the Calendering Materials Division in the Boston district of the Bakelite Co. Mr. Bisgrove has been transferred to the Clifton, N. J. sales district of the Calendering Materials division.

CAMERON J. DUFF, formerly in charge of technical service in Brazil and Columbia for Rohm & Haas, has joined the sales force of the Witco Chemical Co.

DR. P. F. DERR, has been named process research supervisor in the laboratory section of the research and development department of the Westvaco Chlor-Alkali Division of the Food Machinery and Chemical Corp., of New York. DR. RAYMOND ANNINO has been appointed analytical research supervisor in the laboratory section, and G. S. HAINES technical staff assistant.

R. E. WILKINS has been promoted to manager of the sales research section and W. A. TERRALL, JR. to manager of the sales forecasting section of the Marketing Research Department of the Firestone Tire & Rubber Co.

LOUIS A. ROSENBERG, formerly eastern zone manager of retail operation, has been appointed manager of the eastern zone of the B. F. Goodrich Tire Co.

L. J. KEYES has been appointed director of purchases for the Dayton Rubber Co., Dayton, Ohio, succeeding C. D. BUCHER, who has resigned.

CHARLES G. SUCHY and WILLIAM W. BULKELEY have been appointed sales representatives for the floor products division of Hewitt-Robins, Inc., Stamford, Conn., in the Chicago trading area.

W. RUSSELL BONE, formerly with the Package Division of the Anchor Hocking Glass Corp., has been appointed to the newly-created position of assistant to the executive vice-president of Ball Brothers Co., Inc., Muncie, Ind.

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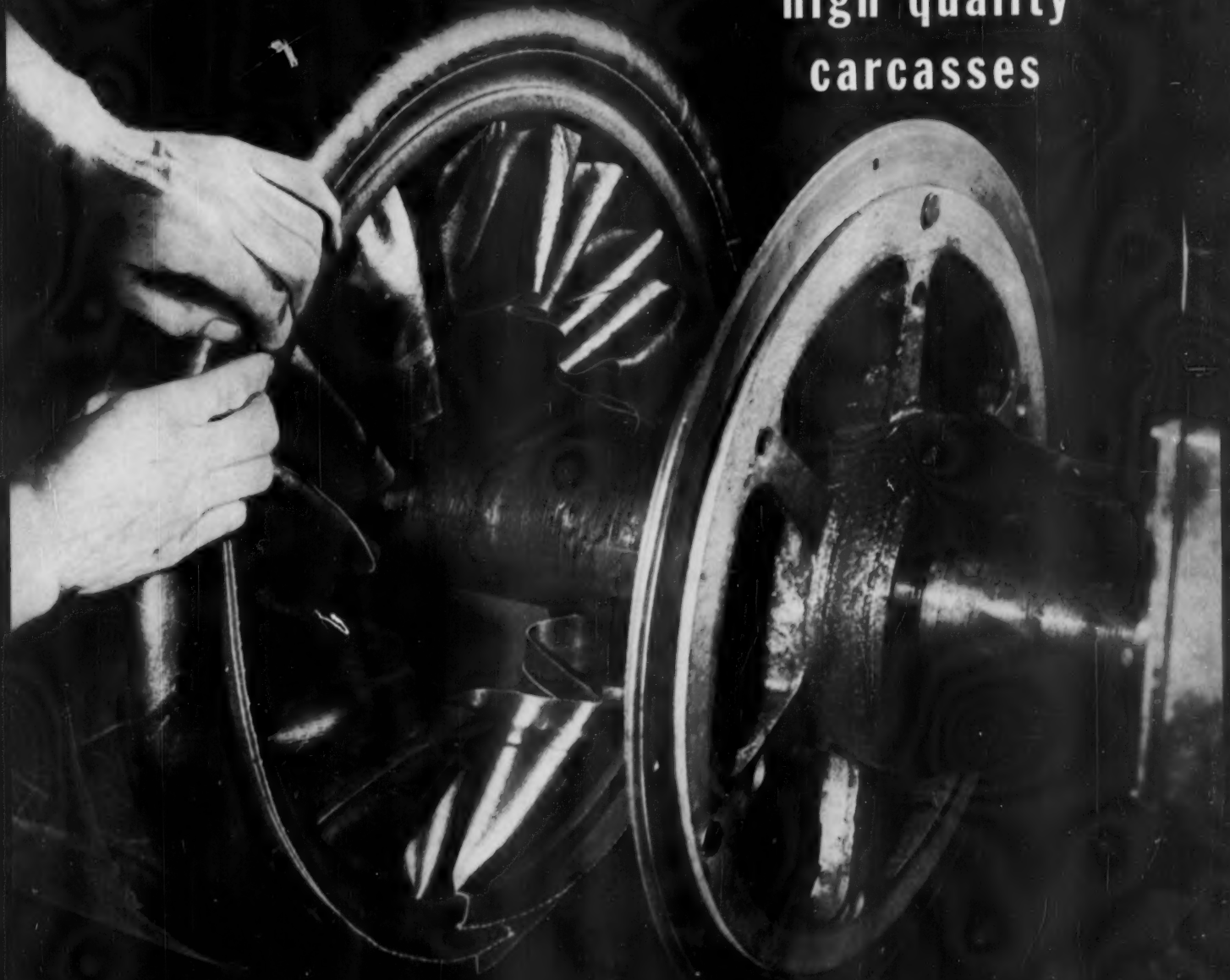

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COLUMBIAN CARBON COMPANY
380 Madison Avenue, New York 17, N. Y.

Army Tests Coral Rubber Tires

Firestone Tire & Rubber Co. has announced the completion of a series of tests by U. S. Army Ordnance on military truck tires made entirely of "Coral Rubber," Firestone's new natural-like synthetic rubber. Army technical experts tested the large, heavy duty tires—size 14.00-20—on loaded military vehicles over rough terrain in extreme summer heat at Camp Bullis, San Antonio, Texas. The performance met or exceeded all military requirements. Firestone points out that tests on commercial truck tires showed Coral Rubber to be outstanding in its resistance to cracking and capable of withstanding the intense temperatures generated by truck tires carrying heavy loads for long distances as well or better than natural rubber. Patent rights, research data and experimental quantities of the new rubber were offered to the Department of Defense and the rubber industry for advanced tests last year. Harvey S. Firestone, Jr., chairman of the company, in commenting on the Army Ordnance tests, said that the nation no longer need be dependent on imported rubber in a national emergency. "The successful development of this synthetic rubber," according to Mr. Firestone, "may eliminate the necessity of extensive stockpiling of natural rubber in the United States."

QM Advisory Committee Meets

The Industry Advisory Committee to The Quartermaster General on Rubber Gloves, met at the Philadelphia Quartermaster Depot in Philadelphia, Penna., on July 24, 1956, in order to discuss provisions and adequacy of Specification MIL-G-12223A, "Gloves, Toxicological Agents, Protective" and encourage industry to participate in the production of this item. The glove was described as a 5-ply glove of neoprene and nylon, which construction affords excellent protection against toxicological agents. Industrial representatives were requested to review and comment on the specification and make any suggestions for amendments which might simplify the production and procurement of the gloves. It was agreed that the specification was satisfactory in its present form, and that industry could supply these gloves as needed.

FMC Forms New Division

Dr. Carl F. Prutton, executive vice-president of the Food Machinery and Chemical Corp., has announced the formation of an FMC Organic Chemicals Division to take care of the corporation's expanding interests and activities in organic chemicals and plastics. The new FMC Organic Chemicals Division will be responsible for the manufacture and sale of all plastics produced by FMC and of all organic chemicals produced by FMC, which are not directly linked with the operations of one of its other Chemical Divisions. Henry S. Winnicki, formerly director of engineering and development for FMC Chemicals, becomes president and manager of the FMC Organic Chemicals Division with headquarters in New York.

Firestone Promotes R. D. Smith

Randall D. Smith

Randall D. Smith has been appointed vice-president in charge of manufacturing and development engineering for the Firestone Industrial Products Co. Mr. Smith, who has been plant manager of the Noblesville, Ind., plant of Firestone Industrial Products, a division of the Firestone Tire & Rubber Co., will be located at the home offices in Akron, Ohio. He received his early education in St. Louis, Mo. and attended the University of Illinois, graduating with a bachelor of science degree in civil engineering in 1929. He joined the Firestone College Training Class the same year.

Upon completion of his training, he went into the Akron Plant 1 Engineering Department and then served as engineer for the Mechanical Goods Division, which later became the Industrial Products Division. In 1936, he went to the Noblesville plant to install its original equipment. Two years later, he went to Fall River, Mass., to install the equipment for the company's new manufacturing plant for latex products, including foamed latex products and rubber thread. He stayed on as production manager of the plant until 1944 when he was transferred to the New Castle, Ind., plant as plant manager. In 1946 he became plant manager at Noblesville.

New Australian Black Plant

J. M. Huber Corp., New York, N. Y., has announced that a new carbon black plant to be built near Melbourne, Australia, will be designed to utilize the Huber manufacturing process. The plant will be owned jointly by United Carbon Co., Inc. and Shell Petroleum Co., and will produce standard grades of carbon black, matching the corresponding American types. Huber will participate in the distribution of the production of the plant in Australia. Huber sales are being handled by the Arthur H. Pearce Co. of Sydney, and the R. A. Christian Co. of Melbourne.

An index to Volume 79 of RUBBER AGE will be found on pages 175 to 178 of this issue.

Monsanto Chemical Promotes Adams

C. Howard Adams has been appointed manager of plastic product development for the General Development Department of the Research and Engineering Division, Monsanto Chemical Co., St. Louis, Mo. Mr. Adams, who has been research group leader and research technical service supervisor for the company's Plastics Division, will undertake his new assignment at St. Louis on November 1. Prior to that, he will be on a trip to England and France in his capacity as chairman of the American Group for the International Standards Committee on Plastics. In his new assignment, Mr. Adams will serve in a liaison capacity between Monsanto's General Development Department, the Plastics Division, and the company's Central Research Department at Dayton, Ohio. A native of New York, Mr. Adams received a B. S. degree in chemical engineering from the University of Illinois in 1939 and an M. S. degree in theoretical and applied mechanics from the same school in 1945. He joined Monsanto as a chemical engineer in the Plastics Division in 1945, was promoted to group leader in 1947, and was appointed to his present position in 1954.

New DuPont Nylon Plant

A new nylon plant designed to produce 40,000,000 pounds of fiber annually to meet the growing demand for its use in tire cord and other industrial products will be built by E. I. du Pont de Nemours Co., Inc., in Richmond, Va. The multi-million dollar project will be erected on the same site as the company's rayon plant and will be in addition to the large existing plant for production of rayon yarns there. Work is expected to begin sometime late this year and plant startup is planned for the latter part of 1957. Approximately 800 construction workers will be required at the peak of activity. The rayon plant at present employs 2,200 people. Heavy denier, high tenacity nylon yarn, the type to be manufactured in Richmond, is also made by DuPont at its Seaford, Del., and Chattanooga, Tenn., plants. Those plants also make textile nylon which is the exclusive product at Martinsville, Va. Nylon staple is made at Seaford.

Rheology Society to Meet

The Society of Rheology will hold its 1956 annual meeting on November 7 to 9 at Pittsburgh, Penna. Technical sessions will be held at the Mellon Institute and the meeting hotel will be the Webster Hall. A number of interesting papers have been scheduled for presentation covering such topics as adhesion, the effect of hydrogen on metals and metal alloys, methods for experimental determination and theoretical evaluation of viscosity data, and the mechanical rupture of polymeric materials. The meeting will also feature the presentation of the Society's Bingham Medal. Further information on the meeting may be obtained from: John Dusenbury, Chairman of the Publicity Committee, The Society of Rheology, c/o Textile Research Institute, Princeton, N. J.

VARIOUS RUBBER GROUPS OFFERING COURSES IN RUBBER TECHNOLOGY

Within recent years many of the local rubber groups about the country have extended their normal activities to include the presentation of courses in rubber technology. These courses are aimed not only at the younger technologist in the industry, but also serve to familiarize those who have been in the industry for some time with the latest technical developments. Many of the rubber groups are presenting their courses in conjunction with institutions of higher learning, and in this way students can attain needed credits toward different degrees. In recent weeks, the following groups have called to the attention of their members these courses:

AKRON RUBBER GROUP

The lectures on rubber compounding offered by the Akron Rubber Group consists of eleven general information-lecture discussion meetings. All lectures are to be given at the University of Akron by the group and the Evening Division and Department of Chemistry of the University. This series is specifically designed for persons in sales, purchasing, marketing, production and allied fields as well as by technical people. A background in compounding and chemistry is not necessary. The Fall term began on October 8 and continues on Monday evenings through December 17. A fee of $10.00 is charged. Lecturers are drawn from the industry. The Akron group plans to offer a second semester of rubber compounding lectures at which time advanced subjects will be discussed.

BOSTON RUBBER GROUP

The Boston Group course in Rubber Technology began on October 1, 1956 at Northeastern University, Boston, Mass. Weekly lectures are being held for a period of fifteen weeks (December 24 and 31 excluded). This course offers a basic and practical study on the compounding and processing of natural and synthetic rubbers. Common compounding ingredients, various elastomers and basic processing techniques and equipment will be covered. Some attention will be given to test methods, quality control, etc. The course is designed for beginning compounders, salesmen, purchasing agents, production supervisors, specification writers, university students and others interested in broadening their knowledge of the rubber industry.

Robert Loveland (R. T. Vanderbilt), with 26 years of experience in the rubber industry, is serving as instructor for the course which carries a credit of 2½ semester hours toward a degree. A fee of $40.00 is being charged.

BUFFALO RUBBER GROUP

The Buffalo Group is offering a lecture-discussion series on rubber technology at the Millard Fillmore College of the University of Buffalo on sixteen Monday evenings, with the series beginning on September 24. This course is aimed at the practical aspects of rubber technology and is designed to be of use to the factory compounder and technician, sales representatives, purchasing agents, etc. A fee of $40.00 is being charged for this course.

Each of the 16 lectures will be conducted by an authority in the field. At the conclusion of the lecture series a number of plant trips have been scheduled. C. O. Miserentino (Dunlop) is serving as chairman of the Buffalo Group's Committee on Education. Also on the committee are: R. J. Sick (Hewitt-Robins), R. E. Schultz (Buffalo Weaving & Belting), E. F. Sverdrup (U. S. Rubber Reclaiming), F. Kohlshagen (Globe Woven Belting), D. L. Gubala (Pierce & Stevens), and Dr. H. W. Post (Buffalo University).

CHICAGO RUBBER GROUP

The Basic Course in Rubber Compounding offered by the Chicago Group carries a fee of $50 and covers 24 lectures, one field trip and a textbook. The lecture series began on October 2 and continues on Tuesday evenings through April 2. Harold Stark (Dryden Rubber) is coordinating the educational activities of the Chicago Rubber Group. All lectures are being given at the John Marshall Law School in Chicago with each of the lecturers drawn from the industry. The Educational Committee of the Chicago Group includes the following members: John T. Doyle, John C. Gallagher, J. E. A. Hopkins, Frank K. Hoover, Russell A. Kurtz, Vincent J. Labrecque, Maurice J. O'Connor and Frank P. Steitz.

DETROIT RUBBER GROUP

The Detroit Rubber and Plastics Group, in conjunction with Wayne University, Detroit, Mich., is offering two different courses this season. Rubber Technology I is designed for beginning compounders, sales representatives, purchasing agents, writers, etc., who are interested in broadening their knowledge of the rubber industry. Class meetings began on Thursday evening, September 27, and continue on Thursday evenings for a period of 16 weeks. S. R. Schaffer (U. S. Rubber) is serving as instructor for the series which carries a fee of $30.00.

Rubber Technology II also carries a fee of $30.00 and is designed for everyday compounders and other rubber technologists, as well as more advanced university students. Prerequisites are a background equal to that obtained in Rubber Technology I. C. H. Albert (Baldwin Rubber) is the instructor for this course which began on Friday evening, September 28, and which continues on Friday evenings for 16 weeks. R. W. Malcolmson (DuPont) is chairman of the Educational Committee of the Detroit Group.

LOS ANGELES RUBBER GROUP

Once again, the Los Angeles Rubber Group is offering its Basic Rubber Technology Course which has no prerequisites and is non-credit. It is designed to present a broad picture of the industry to new or specialized personnel in rubber and related fields. The first semester, which began on September 27, consists of lectures on natural and synthetic rubbers, basic compounding, processing, curing, equipment, design, and plant visits.

The second semester will include lectures on silicones, neoprene, reclaimed rubber, foam and sponge rubber, carbon black, cements, plant visits, and work in the TLARGI laboratories at the University of Southern California where all lectures will be given. Each semester consists of 16 three-hour classes. A fee of $15.00 is charged.

RHODE ISLAND RUBBER CLUB

Again this year the Rhode Island Rubber Club is cooperating with the Extension Division of the University of Rhode Island in presenting two courses. The first course, on Rubber Compounding, began on September 24 and continues on Tuesday evenings. No prerequisite on the college level is required for this course which covers the subject of compounding on an elementary level. The second course, which began on September 25, offers more advanced studies on Rubber Chemistry. This course continues on Wednesday evenings. A fee of $20.00 is charged for each course.

SOUTHERN OHIO GROUP

A course on Rubber as an Engineering Material is now being offered by the Southern Ohio Group. A series of ten lectures on this subject began on September 26 at the Engineers' Club of Dayton, Ohio. This course deals with the properties and uses of various types of rubber, both natural and synthetic, that are in use today. Emphasis is placed on the application of these materials with reference to the engineering design of rubber parts.

The course is chiefly designed for persons whose daily work brings them into contact with rubber and who want to learn more about its advantages and limitations as related to its engineering uses. Speakers for the course are drawn from the industry. A fee of $10.00 is being charged for the ten lectures which are being presented on a twice-a-month basis.

Ferro Buys Patterson Foundry

Ferro Corp., Cleveland, Ohio, has acquired the Patterson Foundry & Machine Co. of East Liverpool, Ohio, manufacturers of grinding, mixing and specialized processing equipment, for about $2,000,000. In the transaction, Ferro will assume notes and mortgages and will exchange an undetermined amount of its common stock. According to H. T. Marks, executive vice-president of Ferro, the amount of stock to be transferred will be determined at a later date. R. L. Cawood, president of Patterson Foundry, signed the agreement for his company September 20 and final transfer took place on October 1. Patterson Foundry will be operated as a wholly-owned subsidiary of Ferro. Mr. Cawood is retiring as president of Patterson and will be succeeded by C. W. Gerster, executive vice-president of Louthan Manufacturing Co., also of East Liverpool and a subsidiary of Ferro since 1954. Mr. Gerster will continue his post with Louthan Manufacturing.

Appointed Sales Representative

Donald E. Jones

Donald E. Jones has been appointed sales representative for the U. S. Rubber Reclaiming Co., Inc., in the New York, New Jersey, and New England area. Mr. Jones is a graduate of Case Institute of Technology and has completed courses in rubber technology at Akron University. He was formerly associated with the General Tire & Rubber Co., and the Marshall Rubber Co.

General Latex Personnel Changes

General Latex and Chemical Corp., Cambridge, Mass., has announced several changes and additions to its sales organization. W. H Jefferson has joined the sales staff and has been assigned to the General Latex and Chemical Corp. of Ohio. Mr. Jefferson will supervise sales in the territory served by the company's plant located at Ashland, Ohio. William J. Watson has also been appointed a sales representative in the territory served by the Ashland plant, as has T. G. Tierney. Lawrence F. Haemer has been transferred from the metropolitan New York area to a new territory which includes New Jersey, Pennsylvania, Maryland and Delaware. W. W. Seward has been appointed general manager of the General Latex and Chemical Corp. of Georgia. He will continue to act as sales manager of the territory served by the Dalton, Ga., plant. J. E. Gingrich has also been assigned to the General Latex and Chemical Corp. of Georgia where he will serve as a sales representative in South Carolina, North Carolina and Virginia.

Named Research Coordinator

Dr. Ivey Allen, Jr., associated with the Bakelite Co., New York, N. Y., for 27 years, has been appointed research coordinator in the Research Department of the company. In this newly created position, Dr. Allen will coordinate the efforts of the Research Department with those of production in the establishment of new products. Dr. Allen first joined the Bakelite Research Department in 1929 after receiving his doctorate in organic chemistry at Duke University. Since 1951, he has been superintendent of research.

Court Halts Thermoid Meeting

A special stockholders' meeting of the Thermoid Co., Trenton, N. J., called for September 20th by the Graham-Paige Corp., was stopped and postponed indefinitely by a court injunction pending further investigation of affidavits and legal argument. The injunction was issued by United States District Judge Richard S. Rodney in Wilmington, Del., following a day long hearing in which Thermoid Co. officials charged that the Graham-Paige request was illegal and represented an attempt to take control of the company from majority stockholders. Graham-Paige, a closed-end investment company, called the meeting, overriding refusal of company secretary James Lafferty, on the basis of a company by-law permitting holders of at least 25% of the outstanding stock to call special meetings. The investment company claims to hold 32.1% of the 834,861 outstanding shares and planned, at this meeting, to increase the number of directors from nine to seventeen, elect directors to fill the vacancies and to make seven out of the seventeen directors a quorum for the board. A quorum now consists of five out of nine. The additional directors, Graham-Paige claims, would give it the representation to which it is entitled. Thermoid officials charge that 38,622 of the 247,988 shares the Graham-Paige group presented were "illegally obtained in violation of the Securities and Exchange Act of 1934" and that the investment company does not, therefore, have sufficient shares to call the meetings.

Clevite Harris Names Three

Appointment by Clevite Harris Products, Inc., Cleveland, Ohio, of two special products division representatives and a West Coast sales district manager has been announced. I. J. Carroll and James E. Bushong will serve as special products division representatives, based in the company's Cleveland headquarters, and Henry M. McCarthy will be West Coast manager, in Los Angeles. A rapidly growing producer of specially engineered rubber and rubber-and-metal parts, Clevite Harris is an important supplier to the automotive industry. It is expanding applications of its products in other industries, such as aircraft, marine, home appliances, chemicals and textiles. Mr. Carroll formerly was director of purchases for Hupp Corp.'s Globe Stamping Division and Iron Fireman Manufacturing Co. Previously, he was associated with General Motors Corp. and Cleveland Tool & Supply Co. Mr. Bushong for the past three years has been a sales representative for the Die Supply Division of E. W. Bliss Co. He is active in the Cleveland Chapter, American Society of Tool Engineers. Mr. McCarthy has served as a wholesale representative in the textile and lumber industries and for two years has operated his own electrical supply business in Los Angeles. Clevite Harris operates plants in Milan and Napoleon, Ohio.

Pennsylvania Industrial Chemical Corp., Clairton, Penna., has announced the opening of a sales residency in Cleveland, Ohio, that will cover the northern Ohio area.

Wendrow Named Technical Manager

Benjamin R. Wendrow

U. S. Rubber Reclaiming Co., Buffalo, N. Y., has announced that Benjamin R. Wendrow, formerly chief development chemist, has been advanced to technical manager. Mr. Wendrow has served in various research and development assignments since he joined the company in 1946.

Industrial Exposition Postponed

The National Industrial Exposition of New Products, New Methods and Patents, which was scheduled to be held on October 22 to 26 at the Detroit Artillery Armory in Detroit, Mich., has been postponed until such time as Detroit's new Convention and Exhibit Building is available and adequate housing facilities have been provided through the construction of new hotels now planned. Since the date of completion of the new structures cannot be determined at this time, the exposition management will announce, at some future time, dates upon which the exposition will be held. M. E. Lerner, editor of RUBBER AGE, was scheduled to participate in an exposition conference by a panel of manufacturing experts on new ideas for industry, and was to have moderated the session on rubber.

Management Clinic Planned

A national time and motion study and management clinic, sponsored by the Industrial Management Society as part of its 20th anniversary celebration, will be held on October 31, November 1, 2 at the Hotel Sherman in Chicago, Ill. The program will feature a work simplification film festival during which leaders of government, labor and industry, along with engineers from all parts of the nation, will gather in Chicago to increase their knowledge of what is being done in the field of industrial engineering and production management. Sessions are planned to fit all levels of achievement, from basic to technically advanced information. Additional information may be obtained by writing the Industrial Management Society, 35 E. Wacker Drive, Chicago 1, Ill.

Have some comments to make? Write a letter to the editor! (See page 10.)

Philadelphia Holds Outing

The Annual Summer Outing of the Philadelphia Rubber Group, held this year on August 17 at the Manufacturers' Golf and Country Club, attracted 305 members and guests, a new attendance record. A total of 150 members and guests participated in the golf tournament while a majority of the non-golfers took part in one or more of the activities which had been planned by the Outing Committee. After dinner, prizes were awarded to the golf winners and individual prizes were given to all members and guests who attended the dinner. J. R. Mills (Goodall Rubber) served as chairman of the Outing Committee. He was assisted by: T. N. Loser (Wyrough & Loser), R. B. Carroll (R. E. Carroll), T. W. Elkin (R. T. Vanderbilt), A. L. Shaw (Goodrich), and V. H. Perrine (Thiokol).

First prize in the golf tournament was won by Henry Pryor (R. E. Carroll). For having the low gross score, Mr. Pryor also won the Julius Muhlstein Trophy. Second and third low gross prizes were won by W. B. Curtis (Naugatuck Chemical) and Warwick McCutcheon (Goodrich-Gulf). The low gross winner among the guests was Frank Newton. There was a four-way tie for the most "threes" among members: J. W. Baymiller (Armstrong Cork), Ray Hurst (H. M. Royal), John Roberts (Quaker Rubber), and F. M. Tolin (Alco Oil & Chemical). The winner of most "threes" for guests was Harold Reehling. The first prize winner under the Calloway System was R. J. Rainey (Armstrong Cork). Involved in a five-way tie for second place were P. C. Cramer (Goodrich Chemical), K. Cranker (Thiokol), P. G. Connell (American Cyanamid), J. S. Hickman (DuPont), and J. Pawless (Thiokol). In a four-way tie for guests under the Calloway System the winners were: J. M. Jester, E. S. Kern, Ron Morgan and R. J. Rhoads. Ken Quinn (Moreland) won the prize for high gross. The winners of the hole-in-one contest were: F. W. Herr, William Pender and H. Graber. First prize in the putting contest was shared by J. P. Geris (Bonafide Mills) and F. M. Tolin (Alco Oil & Chemical).

After dinner had been served, B. S. Garvey, Jr. (Sharples Chemicals), chairman-elect of the ACS Rubber Division, gave a report on the forthcoming meeting of the division in Atlantic City. R. A. Garrett (Armstrong Cork), secretary-treasurer of the Philadelphia Rubber Group, advised the members that three cash draw prizes will be awarded at the next meeting of the group which is scheduled for October 26 at the Poor Richard Club in Philadelphia.

Wabash Rubber Opens Plant

Wabash Rubber & Plastics Corp., Seymour, Ind., a subsidiary of the H. O. Canfield Co., of Bridgeport, Conn., has opened a new 15,000 square foot plant for the manufacture of plastic items for the appliance and automotive industry. Designed by one of the nation's leading industrial architects, the plant has 15,000 square feet on a single floor and is equipped with the most modern machinery.

Another Glidden Tour Planned

Firestone Tire & Rubber Co., Akron, Ohio, notes that the nostalgic scene shown below will be one of many to be relived during the 1956 revival of the famous Glidden Tours September 23 to 29 at French Lick, Ind. The 1956 tour will feature two groups of cars, one for Glidden Tour era cars manufactured in 1913 and prior years and Reliability Tour cars produced between 1914 and 1929. From French Lick the vintage cars will participate in tours to Spring Mill State Park; Brown County State Park; Lincoln State Park; Louisville, Ky., and Jasper, Ind. The car in the photograph is a 1910 Ford roadster equipped with Firestone tires especially manufactured by the company to permit the antique cars to take to the road. The oldtimers servicing the tire and checking routes on a map participated in many of the Glidden Tours.

General Tire Buys Byers Stock

General Tire and Rubber Co., Akron, Ohio, has announced the acquisition of approximately 75% of the common stock and 40% of the preferred stock of the A. M. Byers Co. of Pittsburgh, Penna. General Tire has also acquired 60,000 shares from J. F. Byers, Jr. and B. M. Byers of Pittsburgh under the terms of an earlier agreement, bringing the total common shares held by the company to more than 200,000 out of approximately 264,000 common shares outstanding. W. O'Neil, General Tire president, explained that it would now be possible to put Byers into the plastic pipe business on a large scale and enable it to offer a full line of non-corrosive pipe to its customers. Byers also manufactures electric furnace quality steel, and maintains two plants, one in Pittsburgh and one at Ambridge, Penna.

Under the agreement between General Tire and Byers, common stockholders of the latter company will receive $33⅓ per share of General Tire preference, and a warrant to purchase at the initial price of $60 one share of General Tire common stock for each share of $5 preference received. Stockholders will also be permitted to exchange one share of such stock for either 1 1/10 shares of General Tire's $5 cumulative preference stock and a warrant to purchase at the initial price of $70 one share of its common stock, or one share of General's $5 cumulative preferred stock and $10 in cash.

Connecticut Holds Outing

The Annual Fall Outing of the Connecticut Rubber Group was held on September 8 at Grassy Hill Park, Derby, Conn. A number of interesting activities were scheduled for the day. The Outing Committee included: *Chairman,* James R. Boyle (Armstrong Rubber), *Vice-Chairman,* John Coutts (Seamless Rubber); *Treasurer,* Thomas Zimmerman (R. T. Vanderbilt), and *Assistant Treasurer,* F. J. Rooney (G-E). Members serving on various committees included: *Softball,* Al Simon (H. O. Canfield); H. M. Montague (Armstrong-Norwalk); Vin Chadwick (Armstrong Rubber), and Dan Dougherty (Godfrey L. Cabot). *Horseshoes,* Ray Dudley (Whitney Blake); Tom Skipp (U.S. Rubber), and Francis Burger (Phillips Chemical). *Golf,* George Sprague (Goodrich); Bill Maguire (United Carbon), and R. Van Patten Steiger (Harwick Chemical). *Egg-Throwing,* Carl Larson (Whitney Blake), Ed Jaroszewski (Armstrong-Norwalk); Frank Vile (Accurate Insulated Wire); Ernie Owens (U. S. Rubber), and Jim Steiner (A. Schulman). *Greeting,* Dave McKean (Whitney Blake); Charles Haynes (National Polychemicals); Tom Fitzgerald (Naugatuck Chemical), and Otto Lang (K. B. C. Industries). The team from the Bridgeport area won in a softball game against a team representing the Naugatuck area. Prizes were awarded to the winners in the golf tournament.

Amoco Chemicals Corp, Formed

Amoco Chemicals Corp. will be the name of a company resulting from the proposed consolidation of three chemical subsidiaries of the Standard Oil Co. (Indiana), Chicago, Ill. Jay H. Forrester will become president of Amoco Chemicals when consolidation of the companies is completed late this year. The first step in the reorganization has been taken with the renaming of the Hidalgo Chemical Co. to the new name—Amoco Chemicals Corp. The subsidiaries being consolidated are the Indoil Chemical Co., Chicago, Ill., Pan American Chemicals Corp., New York, N. Y., and Amoco Chemicals (formerly Hidalgo Chemical), Tulsa, Okla. Mr. Forrester said that this consolidation is designed to make it possible for Standard Oil (Indiana) to develop its chemical activities more aggressively and to increase sales and operating efficiency. Headquarters of Amoco Chemicals after the consolidation will be at Chicago. The chemical consolidation is part of a recently announced functional reorganization of nine Standard Oil (Indiana) subsidiaries into four.

Abandons Styrene Plant Plans

Firestone Tire & Rubber Co., Akron, Ohio, has abandoned plans for a styrene manufacturing plant in Orange, Texas, as a result of a substantial reduction in the price of styrene on long-term contracts by present producers. Construction work is continuing at Orange on a plant to make butadiene. The plant, with a rated annual capacity of 40,000 tons, is scheduled for completion early next year.

Dawson Wins Best Paper Award

H. G. Dawson

H. G. Dawson, senior research chemist in the Latex Division of the Research Laboratory, Firestone Tire & Rubber Co., Akron, Ohio, has received the "Best Paper Award" for his paper on "A Zinc Oxide Viscosity Test for Hevea Latex" which he presented at the 69th meeting of the Division of Rubber Chemistry, A.C.S., in Cleveland, Ohio, last May. Mr. Dawson was born in Bushnell, Ill., and was graduated from the University of Illinois in 1928 with a B.S. degree in chemistry. He received a master's degree in chemistry from the University of Illinois in 1929. Mr. Dawson joined the Firestone General Laboratory staff in 1943. In 1946, he was transferred to the Research Laboratory and in 1947 he joined the Latex Division where he is a senior research chemist. At the Research Laboratory, Mr. Dawson specializes in crude rubber and natural latex problems pertinent to the activities at the Firestone plantations in Liberia, West Africa.

Tisch Joins Minnesota Rubber

Richard E. Tisch, formerly associated with the Pacific Division of the Bendix Aviation Corp., has been named manager of the new Product Development Engineering Department of the Minnesota Rubber & Gasket Co., Minneapolis, Minn. The new department will conduct research, development and testing operations on all new products originated by the firm and will specialize in solving specific problems from MR&G customers regarding component design and functions. Employed by Bendix since 1951, Mr. Tisch was active in the design and product development sections before becoming senior test engineer and supervisor of their hydraulic and electromechanical engineering test laboratory. Mr. Tisch is a member of the Society of Automotive Engineers and of Alpha Sigma Phi. He attended both the University of Michigan and U.C.L.A., majoring in business administration and engineering.

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More Names in the News

J. T. Callahan, previously equipment sales district manager in Chicago for B. F. Goodrich Tire Co., Akron, Ohio, has been appointed vice-president of equipment sales. Maurice A. Starr, Chicago equipment sales district representative, will succeed Mr. Callahan as equipment sales district manager.

Robert D. Scoville, has been named sales manager of the Pump Department of the Supply Division of Ferro Corp., Cleveland, Ohio. Mr. Scovill was formerly territorial pump sales manager of Robbins and Myers, Springfield, Ohio.

Allen M. Harrelson has been named vice-president and treasurer of the H. K. Porter Co., Inc.

George H. Hand has joined the Stauffer Chemical Co. as an industrial engineer. He will be located at the Molded Products Division in Los Angeles, Calif.

Thomas E. Parnell, associated with the Goodrich organization since 1939, has been named staff superintendent of the B. F. Goodrich Tire Co.

Lee R. Jackson, president of the Firestone Tire & Rubber Co., was awarded a silver and marble plaque on September 21 at the annual banquet of the Michigan Trucking Association in Grand Rapids for his contributions to the American trucking industry.

James M. Martin has been appointed New England sales representative for the Plastics Division of the Escambia Chemical Corp. He was formerly associated with Goodrich Chemical.

H. D. Tompkins, vice-president of the Firestone Tire & Rubber Co., has been elected chairman of the Inter-Industry Highway Safety Committee.

George D. Sheffield has succeeded R. H. Hamilton as purchasing agent of the New York Rubber Corp., 100 Park Ave., N. Y.

Walter S. Beanblossom, formerly supervisor in the research and development department in charge of applied organic research, has been promoted to administrative assistant to management at Hooker Electrochemical Co., Niagara Falls, N. Y.

Edward P. Gillane will take the place of Alexander H. d'Arcambal who retires as president and general manager of the Pratt & Whitney Co., Inc., West Hartford, Conn., on November 1. Mr. Gillane is executive vice-president and a director of the company at present.

Tom W. Macy, Jr., has been named sales representative in the New England territory of the Fatty Acid Sales Department of Emery Industries, Inc. He was previously associated with the General Electric Co.

Snyder Joins Columbian Carbon

Donn Snyder

Donn Snyder has joined the Boston, Mass., sales office of the Carbon Black and Pigment Division of Columbian Carbon Co. of New York, N. Y. Before joining Columbian, Mr. Snyder was employed for three years by the Goodyear Tire and Rubber Co., at Akron Ohio. He is a graduate of Princeton University with a bachelor's degree in chemical engineering (1951) and holds an MBA degree from Harvard Business School. Mr. Snyder is a member of the Akron Rubber Group and the Toastmaster's Club.

Navy Changes Specifications

The Department of the Navy, Washington, D. C., has announced two specification changes. The first is Military Specification MIL-M-17185A (SHIPS) of August 27, 1956, Mounts, Resilient; General Specifications and Tests for (Shipboard Application). An extensive revision of the original which was published on May 12, 1952, this specification covers general design and performance requirements as well as specific tests for determining the suitability and performance characteristics of resilient mounts for use on naval vessels. It is not restrictive as to the construction details of mounts. The second specification change is Military Specification MIL-F-19488 (SHIPS) of July 27, 1956, Fittings, Hose, Water and Steam (other than flexible metallic). This is a new specification covering fittings for various hoses used on naval vessels. Some of these fittings were originally described in the old Navy Department Specification 34-F-3, now cancelled, and others were covered in individual hose specifications.

Aetna Buys Graton & Knight

Sale of the Graton & Knight Co., Worcester, Mass., to the Aetna Industrial Corp., New York, N. Y., has been completed with Aetna acquiring all Graton & Knight assets except the International Packings Corp. of Bristol, N. H. A new corporation, Graton & Knight Co., Inc., has been organized, to which will be transferred all the assets bought by Aetna. The former Graton & Knight Co. has changed its name to International Packings, Inc.

Financial News

Firestone Tire & Rubber Co.

Nine Months to July 31: Net income of $42,904,733, which is equal to $5.27 per share of common stock, compared with $37,584,918, or $4.62 per share, in the nine months ended July 31, 1955. Net sales for the nine months ending July 31, 1956 were $813,750,210, compared with $804,542,173, in the 1955 period. Indications are that the company is heading for an all-time high in sales and profits in the 1956 fiscal year. Both net sales and net income in the nine months to July 31, are the highest ever recorded by the firm for a first nine months period.

Detroit Gasket & Mfg. Co.

Six Months to June 30: Net income of $253,556, which is equal to 33c a share, compared with $1,201,761, or $1.54 a share, in the first six months of 1955. Net sales in the first half of the current year amounted to $19,797,620, against $26,868,928 in the first six months of the previous year. Share earnings in the 1955 period have been adjusted to reflect a 50% stock dividend in December, 1955.

Dayton Rubber Co.

Nine Months to July 31: Net income of $1,630,179, which is equal to $2.21 per share, compared with $1,475,566, or $2.17 per share, in the comparable period of 1955. Net sales for the nine months period to July 31, 1956, reached a record high of $54,172,336, compared with $48,023,231 in the same period last year.

Lee Rubber and Tire Corp.

Nine months to July 31: Net income of $1,162,375, which is equal to $1.37 per share, compared with $1,142,408, or $1.34 a share, in the corresponding period of the previous year. Sales in the nine months to July 31, 1956 were $33,726,284 compared with $31,522,914 in the 1955 period.

Standard Industries, Inc.

Year to April 30: Net income of $30,003, compared with $225,773 in the previous year. Net sales in the year ended April 30, 1956, were $5,401,328 against $4,484,010 in the previous fiscal year.

Baldwin Rubber Co.

Year to June 30: Net income of $983,265, which is equal to $2.28 per share, compared with $734,790, or $1.70 a share, in the 1955 fiscal year.

Canada Wire & Cable Co.

Six Months to June 30: Net income of $1,245,000, compared with $931,000 in the first six months of the preceding year.

Parker Appliance Co.

Year Ended June 30: Net income of $521,425, which is equal to $1.35 a share, compared with $1,120,342, or $2.89 a share, in the previous fiscal year. The report said that lower earnings in the 1956 fiscal year were attributable in part to starting and development costs on new aircraft and industrial products. Backlog on June 30, 1956, was about $10,000,000, compared with $7,400,000 a year earlier. Net sales in the year ended June 30, 1956, amounted to $21,152,382, against $21,907,104 in the 1955 fiscal year.

Midwest Rubber Reclaiming Co.

Nine months to July 31: Net income of $553,631, which is equal to $1.81 per share, compared with $567,179, or $1.84 a share, in the same period of the previous year. Net sales in the nine months to July 31, were $6,781,450 as contrasted to $6,766,346 in the nine months to July 31, 1955.

Aetna-Standard Engineering Co.

Year Ended June 30: Net income of $1,298,064, which is equal to $3.08 a common share, compared with $1,037,790, or $2.58 a share, in the preceding fiscal year. Net sales in the year ended June 30, 1956, totaled $33,372,184, a new high, contrasted with $20,653,345 in the previous year.

A. G. Spalding & Bros.

Nine months to July 31: Net income of $545,000, which is equal to 95c a common share, compared with $695,000, or $1.29 a share, in the nine months ended July 31, 1955. The 1956 figures include earnings of the Rawlings Division from December 9, 1955, the date of acquisition.

To Build Nuclear Reactor

Ten of America's large corporations have formed a new company, Industrial Reactor Laboratories, Inc., to build and operate a privately owned nuclear reactor for industrial research in atomic energy, at Plainsboro, N.J. Organization of this new company was officially announced on September 26. The companies participating are Atlas Powder Co., AMF Atomics Inc. (Subsidiary American Machine & Foundry Co.,) American Tobacco Co., Continental Can Co., Corning Glass Works, National Distillers Products Corp., National Lead Co., Radio Corporation of America, Socony Mobil Oil Co., and the U.S. Rubber Co. Each participant is represented on the new company's board of directors, which will be headed by General Walter Bedell Smith, president, and H. L. Hilyard, vice-president. General Smith is chairman and president of AMF Atomic Inc. Mr. Hilyard is treasurer of the American Tobacco Co.

New Polymeric Plasticizer

A new, primary, polymeric plasticizer has been introduced to compounders of polyvinyl chloride by Eastman Chemical Products, Inc., Kingsport, Tenn. According to company spokesmen, interest in the new plasticizer, designated "Eastman Polymeric Plasticizer NP-10," centers around its combination of permanence properties coupled with its ease of processing into vinyl compounds and its low color. The company states that full advantage can be taken of the plasticizer's permanence properties with no other modifying plasticizers required. Polymeric Plasticizer NP-10 is highly resistant to hydrolysis and thus can be expected to remain unaffected by moisture under the most severe outdoor weathering conditions. Its loss from vinyl films to hydrocarbons (heptane), soapy water and activated charcoal is extremely low, insuring complete plasticization throughout the life of the plastic material. It also shows little tendency to migrate to materials with which such vinyl formulations might come into contact. It has low color, less than 100 ppm (APHA). The plasticizer produces films of excellent low-temperature flexibility. The product is a viscous liquid, easily handled even in cool weather. It "mills in" rapidly during compounding with vinyl resins.

Monsanto-England Expanding

A long term expansion program for the development of new chemicals from petroleum has been announced by Monsanto Chemicals, Ltd., London, England. The company plans to spend over $20,000,000 on the program. As a first step, a new factory will be constructed on a 100-acre site alongside the Fawley, Hampshire, refinery of the Esso Petroleum Co., Ltd., from which Monsanto will draw feedstock for conversion into a wide variety of raw materials for use in the rubber, plastics, textile, paint, paper and other manufacturing industries. Another plant to be erected will be for the manufacture of 10,000 tons of polyethylene a year. The next products in the company's program will be copolymers of acrylonitrile, butadiene and other monomers. Following this, a major plant is to be constructed for the manufacture of acrylonitrile, an important chemical not now made in England.

Avisco Super Rayon Tire Yarn

American Viscose Corp., Philadelphia, Penna., is now producing a fine denier super rayon tire yarn. This addition to the high strength line permits Avisco to offer a wide range of yarns tailored for industrial uses. The Avisco product will be available in 1100 to 2200 denier, with or without twist, 1.0 to 2.25 denier per filament. Each type can be offered in a wide range of strength and other physical characteristics. In the low denier, super Rayflex type, the company claims, the Avisco tire cord approaches nylon strength characteristics while remaining within the rayon price range. This is the first Avisco high strength yarn to be offered in low deniers per filament.

Vinyl-Silicone Rubber Compounds

A new series of "pre-conditioned" vinyl-silicone rubber compounds which are said to meet the toughest aeronautical specifications for high temperature applications has been announced by the Silicones Division of the Union Carbide and Carbon Corp., New York, N. Y. The compounds are now commercially available and are marketed as Union Carbide "K-1044R," "K-1046R," "K-1047R," and "K-1048R" Silicone Rubber Compounds. They are described as being "preconditioned" because the manufacturer ships them in such a condition that they are easy for the fabricator to process. The vinyl-silicones also have the controlled reactivity which featured the K-1020 and K-1030 series announced earlier this year. Other features of the K-1040's are high tear, high elongation, tensile strength of over 800 pounds per square inch, low compression set, good oil resistance, low moisture absorption, good dry and wet dielectric properties.

Because of all these properties, it is now possible, Union Carbide states, for the rubber fabricator to buy one compound which meets the Aeronautical Materials Specifications (AMS), the joint military rubber (Mil-R), and American Society for Testing Materials (ASTM) specifications in the appropriate hardness. The K-1040's also have civilian uses, as for instance in home appliances. Union Carbide K-1040R series have a Durometer hardness range of from 40 to 80; the K-1044R being the 40 hardness material and the K-1048R the 80 hardness material. The R denotes the red color of the compound.

The company states that fabricators will find that just a few turns of the mill will process the compound to a freshened state ready for fabricating; this may sometimes take less than a minute. The controlled reactivity characteristic makes possible low compression set without use of toxic additives, and permits the employment of new catalyst systems which eliminate step-wise post-cures for thick sections. The K-1040's may be bought uncatalyzed or with a catalyst specified by the fabricator. They are available in 25, 50 and 150 pound fibre board drums.

Nalco 71-K Antifoam Agent

A new antifoam product, believed to be the first water-base liquid antifoam offered to industry, has been introduced by the National Aluminate Corp., Chicago, Ill. "Nalco 71-K" was developed for control of foaming in paper and pulp mills where oil-based formulations were only partially successful. The product has been highly effective both in controlling foam and eliminating entrapped air, the company says, and is expected to be useful in processes where oil base antifoams are ineffective or may lead to product contamination. Nalco 71-K is composed of antifoam agents in an aqueous-solvent carrier and contains self-emulsifying and emulsion stabilizing materials that promote rapid dispersion of the chemical foaming systems.

Assigns Israeli Patent Rights

Joseph A. Talalay, inventor of the foam rubber production process which bears his name, has assigned his patent rights in Israel to the Technion-Israel Institute of Technology. Mr. Talalay received a consideration of one dollar from Technion for the patent rights. The papers of assignment were accepted on behalf of the Institute by Jacob Mark, a director of the American Society for Technion-Israel Institute of Technology in New York. Mr. Talalay expressed the hope that the assignation of the patent rights would encourage the production of foam rubber in Israel and that the royalties made available to the Technion would strengthen science and technology in that country. The initiative for the assignment of Mr. Talalay's patent rights in Israel came through the American Society for Technion, which seeks to encourage American inventors to assign their Israel patents to the Institute of Technology in order to stimulate industrial development in the new State.

GSA Stockpiling Reorganized

The General Services Administration, Washington, D.C., has announced that its stockpiling unit has been reorganized and renamed the Defense Materials Service in accordance with the present character of its duties. Formerly known as the Emergency Procurement Service, the Defense Materials Service under the reorganization will continue to carry out stockpiling objectives received from the Office of Defense Mobilization and will also handle other directly defense-connected activities assigned to GSA. The reason for the name change is that it more properly reflects the concentration of defense activities of GSA in a single service, and the fact that the maintenance and operation of the national stockpile, including procurement of materials for it, will be a sustained activity for national defense rather than an emergency project.

Acquires Automotive Fibres

A management group headed by Paul V. Shields, senior partner of the New York investment banking firm of Shields & Co., has acquired control of National Automotive Fibres, Inc., of Detroit, Mich. Mr. Shields has been elected chairman of the board, according to J. G. Bannister, president, who added that the board has been realigned to include H. V. Sherrill and Eugene H. Catron, partners in Shields & Co., General E. M. Powers, formerly vice-president of Curtiss-Wright Corp.; A. Knox Tyson, president of the Slick Oil Co., and Robert Ayers, president of La Consolidada, steel fabricating company of Mexico City. Sources close to the company said the new board "should bring good financial management" to the company and "help stabilize its earnings picture, possibly through diversification." Mr. Shields said his group had purchased a "substantial block" of National Automotive Fibres stock from a group of individuals. He declined, however, to specify how many shares had been bought or the price paid. The company has 1,095,760 shares outstanding. National Automotive Fibres recently opened a $1,250,000 plant for the production of foam rubber and plastics products in Trenton, N. J., and it is thought the new management group may step up this move toward diversification.

Appointed Manager of Research

The appointment of Dr. Bruno H. Wojcik as manager of research and development for the Industrial Chemicals Division of the Olin Mathieson Chemical Corp. has been announced. Dr. Wojcik joined the company in 1950 and has served in various research capacities. The company also announced the appointments of Bernard H. Nicolaisen as assistant manager of research and development in charge of the division's laboratories at Niagara Falls, N. Y., and of Dr. Chester White as supervisor of the Rochester, N. Y., laboratories.

SUCCESSFUL TESTS COMPLETED ON FIRESTONE COLLAPSIBLE TANKS

Successful tests of giant collapsible rubber tanks manufactured by the Firestone Tire & Rubber Co. have just been completed in the oil fields of the southwest under actual operating conditions. The tanks, designed for oil, water or other liquids in areas where storage or transportation problems occur, are made of tough, rubberized nylon and have a 15,000 gallon capacity. When filled they are 45 feet long, 11 feet wide and six feet high. They can be rolled up like a sleeping bag into a package eight feet long by two and one-half feet in diameter. A built-in pressure-release system prevents rupturing from overfilling.

News in Brief

Manhattan Rubber Division, Raybestos-Manhattan, Inc., Passaic, N. J., has created a new eastern sales region with headquarters at 500 Fifth Avenue, New York, N. Y. The new region combines the New York, Philadelphia and North Jersey districts.

Office of Technical Services, U.S. Department of Commerce, Washington 25, D. C., has released two technical reports of interest to the rubber industry: Report PB 111869, "Adhesive for Composite Material Used in Printed Circuitry," 41 pages, $1.25; and Report PB 121020, "Development of an Improved Fungicidal Vinyl Coating for Cotton Fabric," by R. R. Heitkamp, W. J. Dewar and D. D. Eichorn, 46 pages, $1.25.

Stokes Molded Products Division, Electric Storage Battery Co., Trenton, N. J., has introduced a plastic battery plaque, made of mylar polyester film backed with a specially-designed adhesive, which will replace the present method of gluing or painting identification medallions on battery cases.

A 20-page booklet describing Mathieson organic, inorganic and specialty chemicals, listing characteristics, grades, containers and producing points for each, has been issued by the Olin Mathieson Chemical Corp. Copies are available from the Industrial Chemicals Division, Baltimore 3, Md.

Firestone Tire & Rubber Co., Akron, Ohio, has made available two wall charts describing methods of mounting and repairing tubeless tires. The chart on repairing tubeless tires includes instructions for using the Firestone Repair Kit to make permanent repairs without removing the tire from the wheel.

The B. F. Goodrich Chemical Co. "House of Today," containing nearly 100 practical applications of vinyl plastic resins, made its initial appearance at the Seventh National Plastics Exhibition in the New York Coliseum.

Harchem Division of Wallace & Tiernan Inc., Belleville, N. J., has opened a new eastern shipping and storage depot at Belleville for their "Century" brand oleic acids.

Work on the Goodyear Tire & Rubber Co. multi-million dollar distribution center, located at Brook Park, near Cleveland Airport, is scheduled for completion in November, with sections of the warehouse available for occupancy in September.

One hundred winners of a national annual soil conservation awards program have been announced by the Goodyear Tire & Rubber Co., sponsor of the competition. The 1956-1957 conservation program, currently in progress, marks the tenth year of the event.

An appendix, describing the procedure to be followed to conduct specific-inductive-capacity or water-absorption tests, has been issued for the current edition of the "Standard for Rubber-Covered Wires and Cables."

"Maraset" has been registered by the Marblette Corp., Long Island City, N. Y., as a new trademark for its line of epoxy resins for plastic tooling and other production purposes in various industries.

The new edition of "Facts in Figures about Atlanta" which reflects the growth and development of the region around Atlanta, Ga., has been made available by the Industrial Bureau of the Atlanta Chamber of Commerce.

A new color chart folder illustrating the colors of inorganic pigments of the Color Division, Ferro Corp., 4150 East 56 Street, Cleveland, Ohio, has been made available. The chart also gives data and specifications such as specific gravity, bulk density fineness residue on 325 mesh screen, oil absorption and composition.

Dayton Rubber Co., Dayton, Ohio, is marketing a special kit, the "D-20," of pre-curved heater hose containing seven different lengths and 12 water-tight metal connectors to accommodate 12 leading makes of automobiles and trucks.

Pennsylvania Industrial Chemical Corp., Clairton, Penna., has announced the opening of a new South Atlantic district sales office in the Prudential Building, Jacksonville, Fla. Telephone: Exbrook 8-8686.

Evaluation tests by the Parker Rubber Research & Development Laboratory have indicated that Parker O-ring compound 77-018 fully meets the requirements of a recent SAE specification, "AMS-3357," calling for a silicone material that has lubrication oil resistance and good compression set qualities and that is suitable for a temperature range of —65° to 450°F.

A recent Hycar Technical Newsletter, published by the B. F. Goodrich Chemical Co., Rose Building, Cleveland 15, Ohio, discusses a liquid GR-S polymer, Hycar 2000X68, which is now available in experimental quantities. Ask for volume V, number 2.

Claremont Pigment Dispersion Corp., 39 Powerhouse Road, Roslyn Heights, N. Y., has made available literature on the following products: "RP" ink for rotogravure printing on treated polyethylene film, "VC" solvent based inks for vinyl valley printing, "UR" color paste concentrates for pigmenting urethane foams, "K" calibrated color pastes for vinyl plastisol compounding, and "D" calibrated color pastes for vinyl compounding.

Cellosize hydroxyethyl cellulose WP-4400, a new, high viscosity thickening agent for latex paints said to improve paint properties, is now available from the Carbide & Carbon Chemicals Co., New York, N. Y.

Rhodia, Inc., New York, N. Y., has announced the appointment of Comerciale Reka S.A. as sales and technical representative for synthetic aromatic chemicals and compounds and "Alamask" industrial reodorants in Mexico, with offices in Mexico City.

Phillips Chemical Co., Bartlesville, Okla., has opened six district offices of its Plastic Sales Division preparatory to full-scale marketing of the company's new family of polyethylenes, trademarked "Marlex." The offices are located at Pasadena, Calif.; Elmhurst (Chicago), Ill.; New York, N. Y.; Akron, Ohio; Providence, R. I., and Bartlesville, Okla.

"SE-701" is a new silicone rubber cloth coating compound, which is claimed to have superior handling qualities, that has been added to the standard products list of the Silicone Products Department, General Electric Co., Waterford, N. Y.

"Acetophenone" is the title of a bulletin issued by the Carbide & Carbon Chemicals Co., New York, N. Y., giving information on the properties, specifications, shipping containers, constant-boiling mixtures and solubilities of the aromatic ketone. Ask for Bulletin F-6970.

Parker synthetic rubber compound 47-731 has been formulated by the Parker Rubber Research & Development Laboratory to meet requirements of AMS-7271, covered by drawing MS-9021.

Lord Manufacturing Co., Erie, Penna., has announced the opening of new field offices in Boston, Mass., and Cleveland, Ohio. The Boston office is located in the Statler Office Building, and the Cleveland office at 1507 Brookpark Road.

"ASCO Solenoid Valves" is the title of a catalog containing engineering information, flow charts, operation and construction details, illustrations, prices, etc., issued by the Automatic Switch Co., 391 Lakeside Avenue, Orange, N. J. Ask for Condensed Valve Catalog, No. 201.

Beech Aircraft Corp., Wichita, Kan., is equipping twin-engine Beechcraft Super 18 models with 11.00-12 mainwheel nylon tubeless tires, plus wheels and brakes, manufactured by the Aviation Products Division, Goodyear Tire & Rubber Co.

Parker Rubber Research & Development Laboratory has announced the formulation of hydraulic O-ring compound 47-761 to meet requirements of specification MIL-P-18017 A, covered by drawing MS-28784.

"Resgrip," a synthetic plastic, viscous adhesive to be used to replace stitching in the millinery trade, has been developed by the Adhesive Products Corp., New York, N. Y.

Vulkene Reinforced Polyethylene

Plastics parts fabricated from irradiated carbon-black filled polyethylene are being produced experimentally by the Chemical Development Department of the General Electric Co., Pittsfield, Mass. Known as "Vulkene 107-E" vulcanized reinforced polyethylene, the new material is a black, tough, flexible plastic with physical properties, heat and chemical resistance reportedly superior to conventional high pressure polyethylene, from which it is derived. Yield strength at low temperature for Vulkene 107-E is said to be double that of polyethylene, and creep deformation is reduced to approximately 10% of the value obtained for polyethylene. Due to its cross-linked structure, Vulkene 107-E can reportedly be carried to its decomposition temperature without melting. At 300°F. it retains a tensile strength of 500 psi. Its excellent heat stability has been demonstrated in long-term exposure tests in hot air and boiling water. Other significant properties cited are outstanding chemical resistance and resistance to inorganic acids, and elimination of stress corrosion cracking. Due to its high carbon black loading, Vulkene 107-E reinforced, irradiated polyethylene is electrically conductive. General Electric reports it is presently test marketing a modification of the material as semiconductor tape in shielded power cable. Preliminary evaluations are said to show excellent promise for this application.

OTS Rubber Research Reports

Two new catalogs of Government technical reports available to industry on rubber and adhesives have been compiled by the Office of Technical Services, U. S. Department of Commerce. The catalog on rubber lists 193 items and the one on adhesives 478 items in the OTS collection. Reports listed are primarily the results of research done by the Government or by private laboratories working under Government contract for the Army, Navy, Air Force, and other agencies, but also include German technical papers captured by the Allies in World War II. They are available to industry at a nominal cost to cover printing or microfilming and handling. CTR-321 *Rubber*, price 10c, and CTR-300 *Adhesives*, price 25c, may be ordered from OTS, U. S. Department of Commerce, Washington 25, D. C.

Mather Named Representative

Frank A. Mather has been named a special representative to the Philadelphia district of the Chemical Division of the Goodyear Tire and Rubber Co. He will work primarily in the sale of Chemigum, Pliolite, and Pliovic latices for textile applications and will handle sales and service requirements for the paper industry. Mr. Mather has several years of technical service and sales experience in related industrial fields. He is a member of the American Association of Textile Chemists and Colorists and the Philadelphia Rubber Group of the American Chemical Society. He holds a bachelor of science degree in Chemistry from Dickinson College, Carlisle, Penna.

Pirelli to Produce Campco Sheet

Pirelli S.p.A. of Milan, Italy, will manufacture Campco-type thermoplastic sheet under a recently completed licensing arrangement with the Chicago Molded Products Corp., Chicago, Ill. Campco thermoplastic sheet is a product of the Campco Division of Chicago Molded Products. According to the manufacturer, Campco GM opened the way for the use of rubber modified styrene sheet by the appliance industry, because of its easy, economical formability on low cost molds, its impact and moisture resistance and its porcelain-like finish. Campco sheet has also found many applications in other fields such as the display and toy industries. The agreement between Pirelli and Chicago Molded includes an interchange of technical information on sheet extrusion methods, processes and machinery, as well as training in this country of Italian representatives in Campco manufacturing methods.

Resumes Sale of Valron Estersil

The Elastomers Division of E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has resumed the sale of "Valron" Estersil and will now handle future business with both the rubber industry and the manufacturers of silicone gums. After the Elastomers Division terminated the sale of Valron to the rubber industry in April, 1955, interest in the product continued because of the unique properties imparted to silicone gums reinforced with it. Limited amounts of Valron have been provided in the interim by the company's Grasselli Chemicals Department to interested companies. During the period of limited plant operation, the quality of Valron has been improved greatly, DuPont states. The company is now in a position to supply specification material in tonnage quantities.

Goodyear Road Tests Tire

Goodyear Tire and Rubber Co. recently tested its new 14-inch tire, the "Custom Super Cushion" in a 14,000 mile road test made on routes usually taken by vacationing Americans. These tests, Goodyear claims, show that the Custom Super Cushion has superior resistance to tread wear, holds the road better due to a lower center of gravity and is superior in general performance over other tires now in use. The tests were conducted by four Goodyear test drivers and a Goodyear development engineer using four cars, a Plymouth, Mercury and two Chryslers. Averaging 400 miles in an eight hour day, the five man crew measured and checked the tires every third day for six major factors to determine performance of the tire. The factors were non-skid depth, tread width, outside diameter, tire width, tread radius and air pressure. The new tire will be standard equipment on many models of 1957 automobiles, Goodyear states.

Loxite Household Cement

A versatile new household rubber cement which will repair anything from a teacup to golf clubs has been put on the market by the Firestone Tire & Rubber Co., Akron, Ohio. The adhesive, "Loxite 7003", has been in use many years and has been proven in industry for bonding metals, plastics and fabrics. The cement never becomes brittle, will not dissolve in oil, water, or gasoline, the company states. It is easy to apply due to a new cap with a spike on top. The spike is used for forcing an opening in the protective metal top. Even if the user forgets to replace the cap and the opening hardens shut with cement, it is a simple matter to make a new opening with this handy spike. This cement is packaged by the Woodhill Chemical Co. of Cleveland, Ohio.

"We really test tires for everything here!"

Super Fleetmaster Truck Tire

A new line of truck tires with a steel wire shield between tread and carcass, designed especially for transit mixers, dump trucks and heavy service equipment used in logging, mining, quarrying and road construction, has been announced by the U. S. Rubber Co., New York, N. Y. The "Super Fleetmaster" has a steel shield that protects the tread from cut and rupture damage and virtually eliminates groove cracking, according to U. S. Rubber. An extra-deep tread gives much greater mileage on the new tires. Wide-angle grooves minimizes stone retention, and the three-rib tread increases stability and improves steering. The tread has numerous biting edges to reduce skids and to provide good traction both on and off the highways.

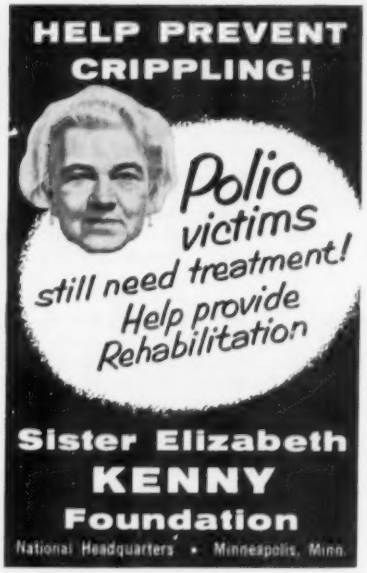
A new tread compound, according to the company, makes the tire exceptionally resistant to chipping, snagging and cuts. Cross-bracing of the grooves also helps to arrest cut growth. Deep, wide shoulder lugs are useful for off-the-road traction and help reduce running temperatures on highways. The Super Fleetmaster is designed for use on front, drive and trailing wheels. It is available in sizes from 7.50-20 to 11.00-24. Larger sizes, ranging from 12.00-24 to 16.00-25, have a nylon cord body and are primarily for off-the-road use. The steel shield Super Fleetmaster will also be constructed in tubeless design to accommodate new trucks now being equipped with tubeless truck tires.

FMC Research Personnel

Three new staff appointments at the Chemicals Research Center of the Food, Machinery & Chemicals Corp. at Princeton, N. J., have been announced. Christian W. Johnson has been named to supervise polymer application research in the Plastics and Polymers Department of the center. Mr. Johnson is a graduate of Columbia University and has attended Princeton University and the Polytechnic Institute of Brooklyn, N. Y. He was formerly director of resin research with Sears, Roebuck and Co. Daniel Warren has joined the Polymer Application Section of the Plastics and Polymers Department. He received a degree at New York University and attended Brooklyn College. He was most recently employed in the Panelyte division of the St. Regis Paper Co. Bernard L. Gilbert has been placed in charge of applied radiochemical research.

Pigment Production Expanded

American Cyanamid Co. has announced plans to expand production of "Unitane" titanium dioxide pigment to 72,000 tons annually at its Savannah, Ga., plant. It is estimated that the new facilities will be in operation by early 1958 and will require approximately 250 additional employees. The plant is located on a 1,600 acre tract along two miles of riverfront. Cyanamid's Unitane, first manufactured at Piney River, Va., was introduced to industry in 1938. Today, both its Savannah and Piney River plants are producing the pigment. Production began at Savannah with completion of the plant in July, last year.



DuPont Promotes Three

John F. Daley, general manager of Organic Chemicals Department, E. I. du Pont de Nemours & Co., Inc., Wilmington, Del., has been elected a director, vice-president and member of the Executive Committee of the company. Samuel G. Baker, general manager of DuPont's Photo Products Department succeeds Mr. Daley. Mr. Baker, in turn, will be succeeded by John M. Clark, assistant general manager of the Photo Products Department. A native of Wilmington, Mr. Daley attended Wilmington schools and the University of Virginia and has been with DuPont since 1915. Widely experienced in the manufacture of explosives, he operated military explosives projects during the war and was awarded a Commendation for Exceptional Civilian Service. Mr. Baker, who will head his third department in his DuPont career, is a graduate of the University of Washington with a degree in chemical engineering and has been with DuPont since 1923. A graduate of Cornell University with a Ph. D. in chemistry, Mr. Clark started with the firm in 1933.

Viscotril-A Thickening Agent

Ferro Chemical Corp., Bedford, Ohio, has announced the development of a thickening agent called "Viscotril-A". According to the company, the product imparts thixotropic body to polar, nonpolar aromatic and aliphatic solvents as well as to non-solvent containing liquid resins and plasticizers. It is a non-yellowing, finely divided powder which is practically odorless and tasteless and is not affected by moisture or age.

A new technical bulletin on propionaldehyde has been issued by Carbide & Carbon Chemicals Co., a division of Union Carbide & Carbon Corp., 30 East 42 Street, New York 17, N. Y. Ask for Bulletin F-40110.

Offers Two New Isocyanates

Two new isocyanates, suitable for many applications never before offered in semi-commercial quantities, are now available from the Carwin Co., North Haven, Conn. "Papi" (polyaryl polyisocyanate) is a dark-amber, somewhat viscous liquid belonging to the aromatic polyisocyanate family. Because its average functionality is equivalent to a tri-isocyanate, Papi is expected to provide superior utility in numerous applications involving the reaction of isocyanates with substances containing activated hydrogen atoms. In coating applications, for example, it is reported that polyisocyanates are excellent for bonding rubber and other elastomers to cloth such as nylon and rayon—Papi should therefore prove advantageous for the manufacture of neoprene coated tarpaulins, rubber coated protective clothing, and fast drying alkyds and drying oils of improved quality.

The second new isocyanate offered by Carwin is "Bunco" (n-butylisocyanate). A water-white, liquid, aliphatic monoisocyanate, it is capable of undergoing all the reactions typical of this class of compound, and is less sensitive to moisture than the aromatic members of this family. Bunco, its manufacturers point out, offers an immediate and simple route to substituted ureas and urethanes for numerous uses. And—by virtue of its reactivity and hydrophobic characteristics—it is expected to find application in the waterproofing of textiles and proteins.

Sintox Synthetic Mineral

The large scale production of a cheap man-made mineral that is expected to emancipate the U.S. from foreign sources of strategic and costly materials such as tungsten has been announced by the Sintox Corp., Allentown, Penna. The development of the new synthetic, known as "Sintox," was first announced in March, and its properties have already attracted wide interest for a variety of applications in automobile and aircraft production, the machining of rubber metal, wood and paper, and in the manufacture of plastics and textiles. Pilot plant operations are currently under way, and the construction of large scale manufacturing facilities will begin shortly. In addition to being able to cut metal faster and longer than conventional cutting materials and turn out work more cheaply and with better finishes, the new material can also machine some of the newer wonder-alloys and plastics at both low and high speeds, according to recent reports.

Electrical Closure O-Rings

Parker Appliance Co., of Cleveland, Ohio, has developed two new synthetic materials for general static seal applications not exposed to temperature extremes. The materials, said to be serviceable to —20°F., were developed to meet requirements such as those covered in military specification MIL-G-18586 and are identified as Parker O-ring compound numbers 37-076 and 590-5.

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Develops New Latex Process

The Sponge Products Division of the B. F. Goodrich Co. has announced the development of a new process for producing synthetic rubber latex. The process makes it possible for synthetic rubber producers to manufacture an improved, high-solids-content latex much more rapidly than any previously known method, according to F. M. Daley, division president. "This substantially increases the reactor productivity of synthetic latex manufacturing plants, thus increasing the capacity of the synthetic rubber industry as a whole," he explained. Mr. Daley said that Goodrich has offered this process to other manufacturers under a uniform licensing arrangement. The first company to sign a licensing agreement is the Polymer Corp. of Sarnia, Ont. Mr. Daley reported that the process was invented by Leon Talalay, technical director of Sponge Products' Texfoam Division. Mr. Talalay has applied for patents and assigned the rights to B. F. Goodrich.

The raw material for the process is a small-particle size but low-solids-content latex similar to that now produced by the synthetic rubber industry in making general purpose rubber for tires and other rubber products. Goodrich obtains its base material from the synthetic rubber plant at Port Neches, Tex., operated by Goodrich-Gulf Chemicals, Inc. Mr. Daley explained that the small particles of the low-solids-content latex are converted to large particles by an instantaneous method known as "freeze agglomeration." This allows the latex to be concentrated to a fluid product of high-solids content and "excellent" properties particularly suited to the manufacture of latex foam rubber for upholstery, bedding and other uses, Mr. Daley added. Until now, the processes for producing the larger-particle-size latex needed by foam rubber manufacturers were cumbersome and costly because of the lengthy reactor time required, Mr. Daley pointed out.

"Talalay's instantaneous freeze-agglomeration process can turn out synthetic latex in much less time than was formerly required," Mr. Daley said. "With the new process, an output of 15,000 pounds of dry polymer per reactor per day can be achieved easily in reactors with conventional agitation and cooling. By the present method, latex reactors which must be equipped with special high-power agitation and cooling produce only about 6,000 pounds per day." The latex foam manufacturer's investment in plant and equipment, all of which is commercially available, is moderate, Mr. Daley added. He estimated that the entire cost of the process of agglomeration and concentration is less than 2 cents per pound of dry rubber content.

Bassons Purchases Plant

Bassons Industries Corp., New York, N. Y., has purchased a 100,000 square foot plant in Yonkers, N. Y., from the former Alexander Smith Carpet works. The Yonkers plant will house Bassons' reinforced plastics forming and electronics divisions.

FINANCIAL BRIEFS

$10,200 worth of the company's preferred stock was presented to a total of 102 employees of Wellco Shoe Corp., Waynesville, N. C., recently. H. W. Rollman, president of the company, announced that each employee who has completed ten years of uninterrupted service with the company was presented with one share of preferred stock having a par value of $100. The stock earns a cumulative dividend of 5% per year. The stock certificates were given to these employees free of charge in recognition of faithful and devoted service to the firm.

Dayton Rubber Co. has declared a 20% stock dividend, payable November 30 to stockholders of record on November 5, in addition to the usual 35c cash quarterly. A 10% stock payment was made in February this year. The usual quarterly cash dividend of 35c will be payable October 25 to stockholders of record October 10. Fractional shares in the stock distribution will be paid in cash.

Graham-Paige Corp., beneficial owner of more than 10% of outstanding Thermoid Co. common stock, in an original report, shows direct holdings of 103,850 common shares and holdings of Whitney Apollo Corp. (wholly-owned subsidiary) of 15,000 shares. Frederic E. Schluter has sold 57,159 of Thermoid's common shares, eliminating his direct holdings.

Francis J. Curtis, vice-president, has bought 5,000 shares of Monsanto Chemical Co. common stock, increasing direct holdings to 8,130. Carroll A. Hochwait, has sold 9,723 Monsanto common shares, reducing ownership to 31,718.

American Smelting & Refining Co., direct beneficial owner of more than 10% of General Cable Corp. capital stock, has purchased 7,900 common shares, increasing direct holdings to 944,218.

Armstrong Rubber Co. has withdrawn from registration a proposed offering of $9,250,000 of convertible debentures "due to existing market conditions," Frederick Machlin, president, announced recently.

A secondary offering of 7,700 shares of Rome Cable Co. common stock at $27.125 a share is being made by A. C. Allyn & Co., New York, N. Y.

Pyramid Rubber Co., direct owner, has bought 4,200 common shares of A. G. Spalding & Bros. Inc., increasing its direct holdings to 89,169.

Henderson Named President

D. E. Henderson, formerly vice-president of Associated Rubber, Inc., Quakertown, Penna., has assumed the duties of president and general manager, succeeding A. N. Shea, who has been appointed chairman of the board and vice-president in charge of sales. Jean A. Shea remains the treasurer, and E. H. Faas the secretary of the corporation.

Esso Research Appointments

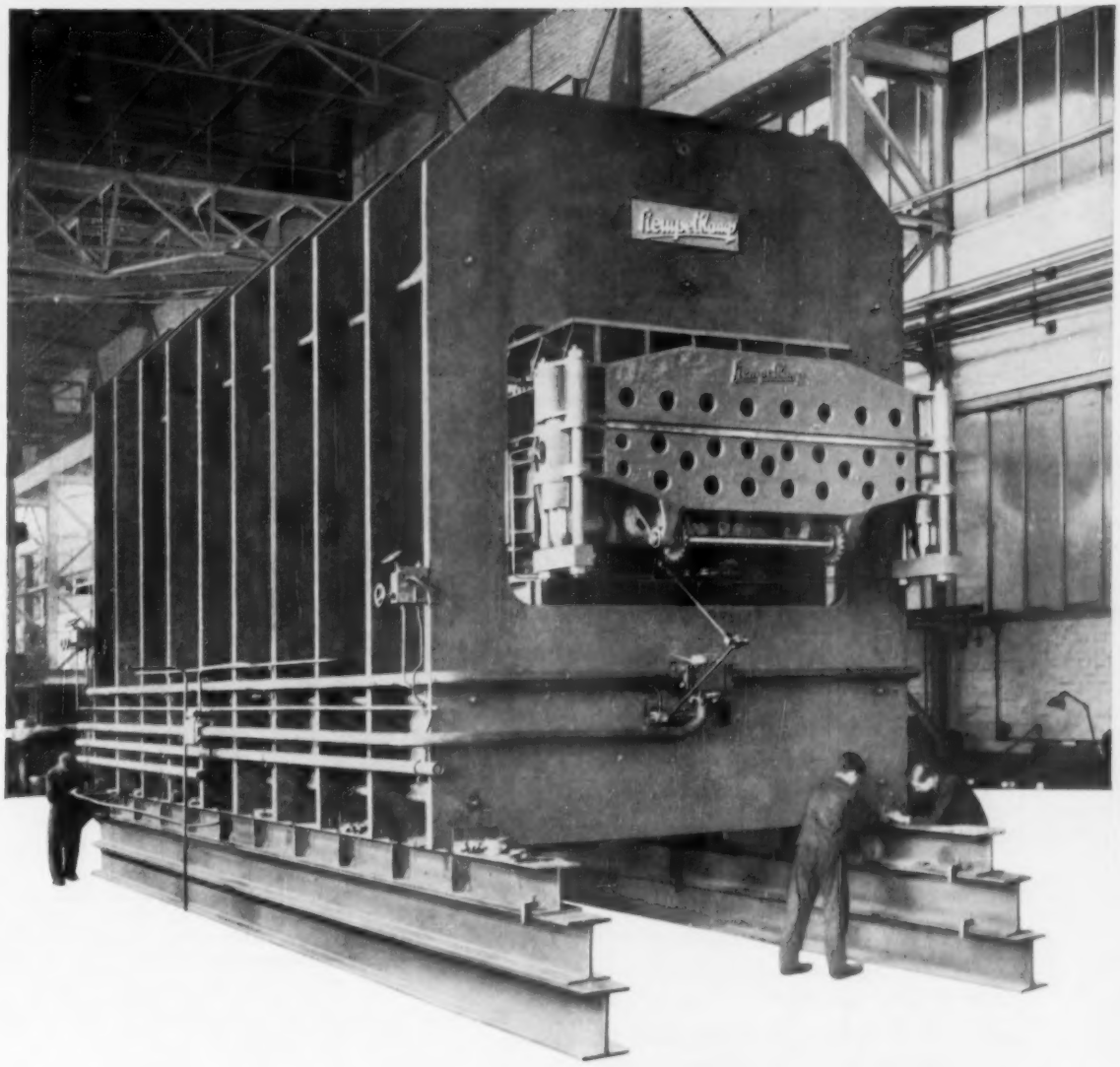
Dr. Charles L. Fleming, Jr., has been elected a vice-president and director of the Esso Research and Engineering Co., New York, N. Y. The new officer will serve as board contact for research on chemicals, pipeline, lubricating oil processes and crude oil production. He succeeds Dr. Carl O. Tongberg who recently resigned to become a vice-president and director of the Carter Oil Co. Harold J. Rose was appointed coordinator of chemical research. He has been in this position on a temporary basis. Dr. John G. McNab, director of the Products Research Division, was promoted to deputy coordinator for petroleum products and medical research, succeeding Dr. Fleming. Dr. Miller W. Swaney, director of the Enjay Laboratories, was named Dr. McNab's successor. Elfried F. H. Pennekamp succeeded Dr. Swaney.

Dr. Fleming has been with the firm since 1938, and became head of the Products Research Division in January, 1954. Among his positions was that of advisor at the laboratories of Esso Research, Ltd., at Abingdon, England in 1947-48. He became an assistant director of the Products Research Division, headquartered at the Esso Research Center, Linden, N. J., in 1950, and associate director in 1953. Mr. Rose joined Esso Standard Oil Co., at Baton Rouge, La., as a research chemist in 1942. He was transferred to the Esso Research Center, Linden, N. J., in 1954. He was named an assistant director of the Chemicals Research Division in 1955. Earlier this year he became acting chemicals coordinator. Dr. McNab came to Esso Research in 1936. He served for two years as associate director of the Products Research Division and last month was named director. He holds some 50 inventions in the field of fuels, lubricants and lubricant additives. Dr. Swaney joined the company in 1939 as a research chemist. A member of the Government's Rubber Reserve Polymer Research Committee in 1942-1944, he became an assistant director of the Chemicals Research Division in 1947. In January, 1954, he was appointed director of the Enjay Laboratories. Mr. Pennekamp came to the company in 1943. Among his previous positions were those of a group leader and head of the Additives Research Section in the Products Research Division. He has been assistant director of Enjay Laboratories since 1955.

Stauffer and West End Merge

The merger of the West End Chemical Co. into the Stauffer Chemical Co. was approved by stockholders of both companies at special meetings on September 25. Of the 3,076,705 shares of Stauffer common stock outstanding, 89% were voted in favor of the merger and .06% voted against. Of the 2,012,197 shares of West End common outstanding, 85% were voted in favor of the merger and .4% voted against.

An index to Volume 79 of RUBBER AGE will be found on pages 175 to 178 of this issue.



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West Coast News

Appointment of Dr. Herman Schneiderman as technical director of American Latex Products Corp., Hawthorne, Calif., has been announced by president Clowes M. Christie. A member of the American Chemical Society and American Rocket Society, Dr. Schneiderman is widely experienced in chemical engineering applications, atomic energy radiation of polymers, rocket fuels and glass fiber plastic structures for the missile industry. He was formerly chief of the Structural Plastics Group at Aerojet-General Corp., Azusa, Calif., senior research engineer at the Jet Propulsion Laboratory, California Institute of Technology, and chief of the Bio-Chemistry Division of the Atomic Energy Project at the UCLA School of Medicine. American Latex Products is one of the West's principal producers of polyurethane plastic foams, both rigid and flexible, and of foam rubber.

Dr. E. G. Partridge, formerly associated with the B. F. Goodrich Co. in research and development work, has been named technical director of the TLARGI Foundation at the University of Southern California. Dr. Partridge received his degree in chemistry from Oberlin College in 1924 and his Ph.D. from the University of Illinois in 1927. From 1927 to 1941, he served as a research chemist with Goodrich. Dr. Partridge was then transferred to American Anode, Inc. In 1944, he was appointed director of research for American Anode, a post he held until 1951. Most recently, he has served as development manager for Goodrich at Akron. Dr. Partridge, the author of many technical articles, is active in the American Chemical Society and other organizations.

Assignment of Woodrow Crank as Western Division sales representative for the products of the Organic Chemicals Division, Dewey and Almy Chemical Co., Division of W. R. Grace & Co., has been announced. Mr. Crank joined Dewey and Almy in January of this year and spent six months at headquarters' laboratories in Cambridge, Mass. before returning to service West Coast accounts. Mr. Crank received his B. S. degree in chemistry from the University of Southern California in 1936. During World War II, he was a Major in the Army Chemical Corps. Previous to Dewey and Almy, he had a total of 15 years' experience with Lac Chemical, Inc., Shell Chemical Co., and American Latex Products, Inc.

Pennsylvania Industrial Chemical Corp. has announced the addition of Maurice G. Stuffmann to its Los Angeles District sales staff. Prior to joining Picco's technical staff in 1948, he had served in the Technical Service Division of the floor tile and thermoplastic resin industry. Mr. Stuffmann was educated in Australia, receiving his bachelor of science degree at the University of Adelaide.

The October 2 meeting of the Los Angeles Rubber Group, scheduled to have been held at the Statler Hotel in Los Angeles, was to have been addressed by R. L. Zapp of the Enjay Laboratories, Linden, N. J. Mr. Zapp was to have spoken on "The Nature of Butyl Rubber and Its Compounds". A full report on this meeting will appear in a future issue of RUBBER AGE.

Homer Neptune, formerly in the Purchasing Department of the Kirkhill Rubber Co., has taken a similar position with the Extruded Rubber Products Co. of Fullerton, Calif.

Quality Products Manufacturing Co. has moved to a new location at 125 West 157th St., Gardena, Calif. The new telephone number is FAculty 1-3981.

The formation of the Lomita Rubber Co. at 18016 So. Vermont, Gardena, Calif., has been announced by Vern Crumm, who was formerly associated with the Rubbercraft Corp. The new firm specializes in custom mechanical molded goods.

J. Dykes, previously associated with California Rubber Products, Inc., has been placed in charge of compound development at Rubber Teck, Inc.

Lee Wilcott, formerly chief chemist with the Lamb Rubber Co., has joined the Department of Water and Power in Los Angeles as a chemist. Howard Wiley, long associated with the Rubbercraft Corp., has joined North American Aviation as a senior engineer.

John Emigh, formerly associated with the Coast Pro-Seal and Mfg. Co., has joined the technical staff of the Caram Mfg. Co.

Edward Bosworth has been named plant engineer at the Goodrich Los Angeles facility. He succeeds T. J. Cook who has been assigned to new duties in Akron.

John Adams has been appointed assistant plant manager at the Los Angeles plant of the U.S. Rubber Co. Ben Adams (no relation) continues as plant manager.

Dick Wells has been named manager of purchases for Firestone-California, including the Xylos Division, succeeding James Cravens.

Another copy of RUBBER AGE needed in your office? Use the coupon on page 163.

Rohm & Haas Acrylic Thickener

Rohm & Haas Co., Philadelphia, Penna., has developed a high-solids acrylic thickener and dispersant for aqueous systems, "Acrysol ASE-75," which offers reduced shipping costs and simplified handling by conversion to a dilute, viscous salt at the point of use. The new type emulsion is supplied as a dispersion of 40% solids and low pH. It converts instantly to a clear, viscous solution upon dilution and the addition of a base, the company states. Typical physical properties of the new emulsion are: 40% solids, plus or minus 0.5%; a pH of approximately 3.0 when packed; a Brookfield viscosity of 20 cps. at 25°C.; a specific gravity of 1.08 at 250°C.; a milky liquid appearance, and an anionic colloidal charge. Acrysol ASE-75, as the sodium, potassium or ammonium salt, is an efficient thickening agent for latex emulsion paints, natural and synthetic latex compounds, adhesives and other aqueous suspensions. The polymer resists putrefaction and provides viscosity stability on aging over long periods of time. An additional advantage of this new type of thickener, the company reports, lies in the fact that the choice of cation for neutralization is left to the user. Organic bases may also be used to neutralize the emulsion if desired.

Polyethylene-Surface Tape

General Tape Corp., St. Paul, Minn., has announced the introduction of a new kind of transparent pressure-sensitive tape for business and industrial use. Designated as tape number "66" until a brand name is chosen, the product utilizes a special polyethylene-surfaced cellulosic backing. This surface, the company states, prevents, to a large extent, accidental breakage, is resistant to acids and alkalis, impermeable to greases, oils and powders, possesses dimensional stability with flexibility at low temperatures, is not subject to brittleness and drying out and has extremely long life. The adhesive of the new tape is of a special long-aging, pressure-sensitive, crystal-clear resinous material. At present the product is available only in the most popular sizes of ½ inch wide rolls, 2592 inches in length, and distribution will be limited to industrial and business users.

Aquacal Calcium Stearate

Beacon Chemical Industries, Inc., Cambridge, Mass., has announced the development of "Aquacal," a stable 45% aqueous dispersion of calcium stearate. A thixotropic paste, Aquacal can be diluted to any concentration and is applicable in most processes using calcium stearate which require or can tolerate the presence of water. Because of the water dispersibility of Aquacal, many new applications are claimed for calcium stearate that were previously impractical with the water insoluble, powdered calcium stearate. The new product is economical and efficient, since it can be applied uniformly and with no waste. It helps eliminate the dust, inconvenience, fire and health problems which may be attendant with the use of powdered calcium stearate, the company states.

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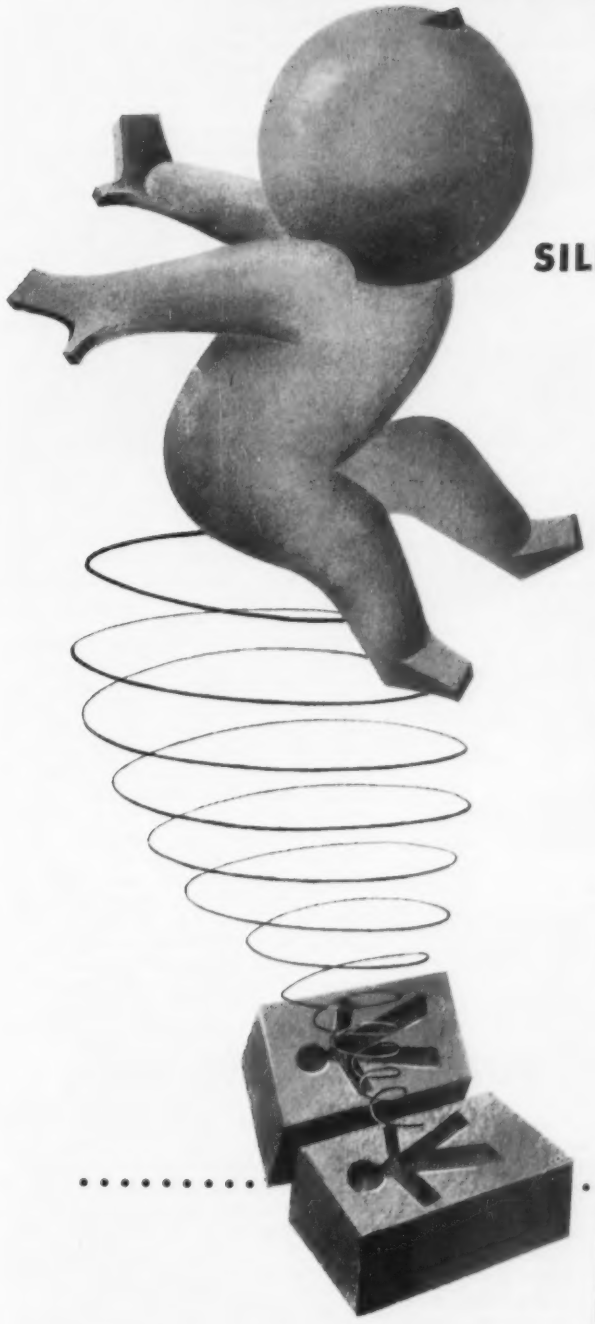

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Canadian News

It is reported that unless some unforeseen development arises, the Polymer Corp. plans to cease its allocation system of marketing rubber for the last quarter of 1956. Polymer continues to operate at virtual capacity, with output expected to reach a new peak of 115,000 tons this year, a 10% boost over 1955, which was itself a record year. A big factor in the future domestic marketing outlook will be the public acceptance of the new 1957 auto models now starting to come off the assembly lines. Auto demand has remained at near peak levels this year in Canada despite a decline in the U. S. The auto tire has been one of the most buoyant outlets for synthetic rubber in the last few years. Polymer's export demand continues to hold at high levels, with outlook for a continuation of this trend into 1957.

Currently, Polymer shipments are going 60% to export markets, 40% to domestic customers. Although company officials are fully prepared for sharply stepped up competition in its overseas markets from U. S. companies, they are counting on their 10-year record in this market, plus their high standard of research, to maintain their strong export position.

Polymer officials have decided to get back into the high solids latex market and see a potential 500,000-pounds-a-year market in Canada. A major outlet for this specialty latex product is in the manufacture of foam rubber for automobile seats, etc. This has been a fast-growing market in recent years. Polymer has been licensed by the B. F. Goodrich Co. to use a new process which manufactures an improved, high-solids-content latex more quickly than by other methods.

Meanwhile, company officials continue to carry on negotiations towards establishment of a butadiene plant in Western Canada. A big factor in the final decision to go ahead with the $15,000,000 plant will be Polymer's ability to conclude satisfactory long-term purchase arrangements with gas producers for butene supplies from their "wet" gas fields.

M. L. Snyder & Son, Toronto, is building an addition to its plant at Woodbridge, Ont., which will more than double the plant's present size. It is believed that the expanding facilities will be in operation by January, 1957. The Woodbridge facility currently produces rubber gloves, waterproof clothing, tubing, dipped goods, etc.

The Seventh Canadian High Polymer Forum will be held on November 8 and 9 at the Guildwood Inn in Sarnia, Ont. The Forum, devoted to all aspects of polymer science, is co-sponsored by the Chemical Institute of Canada and the National Research Council of Canada. A number of interesting papers have been scheduled for presentation and tours of the petrochemical industry in the Sarnia area may be arranged. Reservations and information may be obtained by writing Dr. H. Leverne Williams, Chairman, Seventh Canadian High Polymer Forum, c/o Polymer Corp., Ltd., Sarnia, Ont., Canada.

Dunlop Canada, Ltd., now wholly owned by Dunlop Rubber Co., Ltd. of Great Britain, plans to offer common share participation to Canadians. J. P. Anderson, president of the Canadian firm, said in an interview that Canadians will not be able to buy stock for a year, and perhaps two years, but "local equity participation is company policy and is planned for Canada." Dunlop Rubber offers share participation in French, German, Japanese and other subsidiaries. The parent firm, however, retains a majority of the voting stock and it was expected that it would do so with regard to the Canadian subsidiary.

Mr. Anderson said that before any offering is made to Canadians, the firm must be placed on an attractive profit basis, and the firm is at work doing just that now. He said that unfortunately the Canadian operation had to wait for capital expansion and development behind a long list of war-disrupted operations elsewhere. The U. K. parent has been busy since the war in rehabilitating plantations, rebuilding bombed factories and in extensive retooling.

Evidence that more attention is swinging to Canada comes with completion in Whitby, Ont., of Dunlop's $10,000,000 expansion program, involving a new tire factory and a new Pillofoam plant adjacent to the tire factory. The Canadian company showed a net loss last year of $1,127,459 compared with a new profit of $115,134 in 1954. Last year's loss was attributed to write-offs of all exceptional and non-recurring expenses involved in the transfer of Whitby. Sales for 1955 were at a record level. Mr. Anderson said sales volume to date in 1956 was ahead of 1955.

Douglas G. Sinclair has been named sales manager of the Wooster Rubber Co. (Canada) Ltd., which has opened a new plant at Cookesville, Ont. for the production of the company's full line of Rubbermaid houseware and automotive products. The new plant will produce the company's full line of molded and dipped goods—a major expansion from its present limited production of dipped Rubbermaid houseware items in leased quarters at Port Credit, Ont. These operations, started five years ago, will be shifted to Cookesville.

B. F. Goodrich Co. has licensed the Crown-owned Polymer Corp. at Sarnia, Ont., to use a new process for the production of synthetic rubber latex. F. M. Daley, director of Goodrich's Sponge Products Division which developed the process, said it allows synthetic rubber producers to manufacture an improved, high-solids content latex much more quickly than by previously known methods.

What is said to be the world's largest tank lining contract has been awarded to B. F. Goodrich Canada, Ltd. The contract, awarded by Northspan Uranium Mines, calls for the rubber lining of 147 major tanks and 80 smaller tanks used in the processing of uranium ore near Blind River, Ontario. In addition, several miles of pipes and fittings will be lined. More than 10 acres of rubber will be needed to complete the job.

The Northspan contract is substantially larger than the Algom tank lining job now being completed in the same area by Goodrich Canada. Tanks, ranging in size from 6 to 50 feet in depth, and from 6 to 110 feet in diameter, will be lined at the main site. The smaller tanks will be brought to Kitchener to receive their rubber coatings. Three rubber linings, all Goodrich developed, will be applied to the tanks to protect them against the corrosive and abrasive attacks to which they will eventually be subjected. Work on the gigantic project is expected to begin shortly and is scheduled for completion by July 1, 1957.

Winners of the Polymer Scholarship awards for 1956 have been announced by J. D. Barrington, president. June Alberta Pollard and William George Muir, both residents of Sarnia and graduates of S. C. I. & T. S., have won scholarship awards valued at $4,000 each. The scholarships will be paid at $1,000 per year for a four-year period, subject to continuous good academic standing while in the university. Polymer Corp. established the scholarship this year for sons, daughters, or legal wards of Polymer employees with a minimum of one year of service. The successful candidates are permitted to choose their course of study at any one of the fourteen universities in Canada, which were selected by the company.

LeRoy D. Smithers has been named president and chief executive officer of Dow Chemical of Canada, Ltd., Toronto. He had been executive vice-president and general manager. N. R. Crawford, formerly president, was named chairman of the board. The Canadian company is a subsidiary of the Dow Chemical Co., Midland, Mich.

Enjay Co., Inc., New York, N. Y., has issued a bulletin summarizing the results from a recent evaluation of colors in Enjay Butyl. Ask for Enjay Butyl Bulletin 3.

Wyandotte Chemicals Corp., Wyandotte, Mich., has announced a lowering of prices for tankcar, carload, truckload, mixed car and drum quantities of Quadrol, the company's new polyol.

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Those strange jumping balls, of course, were rubber. But rubber is no longer a plaything. It's so essential that rubber plantations—American style—have sprouted up throughout the country. One of the largest and best equipped of these domestic rubber plantations flourishes at Torrance, California, where Shell Chemical produces a full line of S-type copolymers to fill the needs of large and small Western manufacturers. You'll find that Shell synthetic rubber, available in a variety of solid types and liquid latices, can do a better job for you.

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Obituaries

Charles E. Bennett

Charles E. Bennett, electrical engineer and inventor, died on August 31 in Valley Hospital, Ridgewood, N. J., after a long illness. His age was 74. Mr. Bennett retired five years ago as consulting engineer to the Okonite-Callender Cable Co., Paterson, N. J. He had been with the concern in various executive posts since 1930, including ten years as general manager of the Georgia Railway and Power Co., Atlanta, Ga. He was the inventor of the Bennett "oilostatic" transmission system and the Bennett lightning arrestor and ground rod. A fellow of the American Institute of Electrical Engineers, Mr. Bennett was a member also of the Franklin Institute, and the Passaic County Engineering Society of Professional Engineers. Born in Columbia, Penna., he was graduated from Mercersburg (Penna.) Academy and attended the University of Pennsylvania for two years. Surviving are his wife and daughter.

Wesley H. Esty

Wesley H. Esty, vice-president and treasurer of the Heveatex Corp., Melrose, Mass. died suddenly of a heart attack on August 19 at Lebanon, N. H. A native of St. John, New Brunswick, he had resided in Melrose, since 1915. He was for some years custodian of the Melrose and Malden plants of the U. S. Rubber Co. and he had been with Heveatex since 1934. Mr. Esty was a member of the Lodge of Sterling and Middlesex Lodge, I. O. O. F., both of Malden, and the Knights of Pythias in St. John, N. B. He is survived by his wife and daughter.

John N. Forker

John Norman Forker, retired vice-president of the Koppers Co., and partner in the John N. Forker Co., coal tar chemists of New York, N.Y., died on September 18 in London, England, after a brief illness. He was 70 years old. Mr. Forker, a graduate of Pennsylvania State College, had been with the Koppers Co. for thirty-two years until his retirement in 1949. At that time, he was vice-president and general manager of the Coal Tar Products Division. In 1954, Mr. Forker became executive director of the General State Authority of the Commonwealth of Pennsylvania. He is survived by his wife, a son and a daughter.

James C. Baldwin

James C. Baldwin, partner in Joosten & Janssen, crude rubber agents and brokers in New York, died on September 24 in Lawrence Hospital, Bronxville, N.Y. Mr. Baldwin was 70 years old. He is survived by his wife and daughter.

Harry B. Polson

Harry B. Polson, founder and chairman of the board of the Polson Rubber Co., Garrettsville, Ohio, died after a long illness on September 2 at his home in Shaker Heights, Ohio. He was 80 years old. Mr. Polson was born in Kentucky in 1875 and founded Polson Rubber in 1909 in Kansas City, Mo., for the manufacture of tire accessories and repair materials. In 1917, an additional plant was opened in Cleveland, Ohio, and in 1923 both operations were combined in a new plant at Garrettsville, Ohio, where operations still continue. Though he was of a retiring nature, Mr. Polson maintained active direction of the operating organization he had built up through the years and did so until the closing period of his fatal illness. He is survived by his wife and son.

William C. Haddock, Jr.

William Charlton Haddock, Jr., who retired five years ago as president of A. P. de Sanno & Son, Inc., Phoenixville, Penna., died on September 8 at the Abington Hospital in Abington, Penna. He was 64 years old. A 1914 graduate of Princeton University, Mr. Haddock was a member of the Union League of Philadelphia and the Huntington Valley Country Club. He is survived by his wife, a son and a daughter.

Mayer Maimin

Mayer Maimin, vice-president of the H. Maimin Co., New York, N. Y., manufacturer of cutting machines, died on August 30 of a heart attack at his home in New York City. He was 63 years old. Surviving are his wife, a son and a daughter.

George Lyon, Jr.

George Lyon, Jr., who retired ten years ago as an official of the Anaconda Wire and Cable Co., died on August 15 of a heart attack at New York Hospital. His age was 82. He leaves his wife.

Retreading Consultant Services

George R. Edwards has announced the organization of Retreading Consultant Services at 140 North Gate Road, Manchester, N. H. Mr. Edwards will serve as director of the new organization which will engage in offering consulting services on retreading problems. In addition, the organization will conduct retreading classes throughout the country; engage in on-premise consulting work in retreading plants, and undertake to solve any retreading problems which are presented to it.

Hycar Carboxylic Elastomer

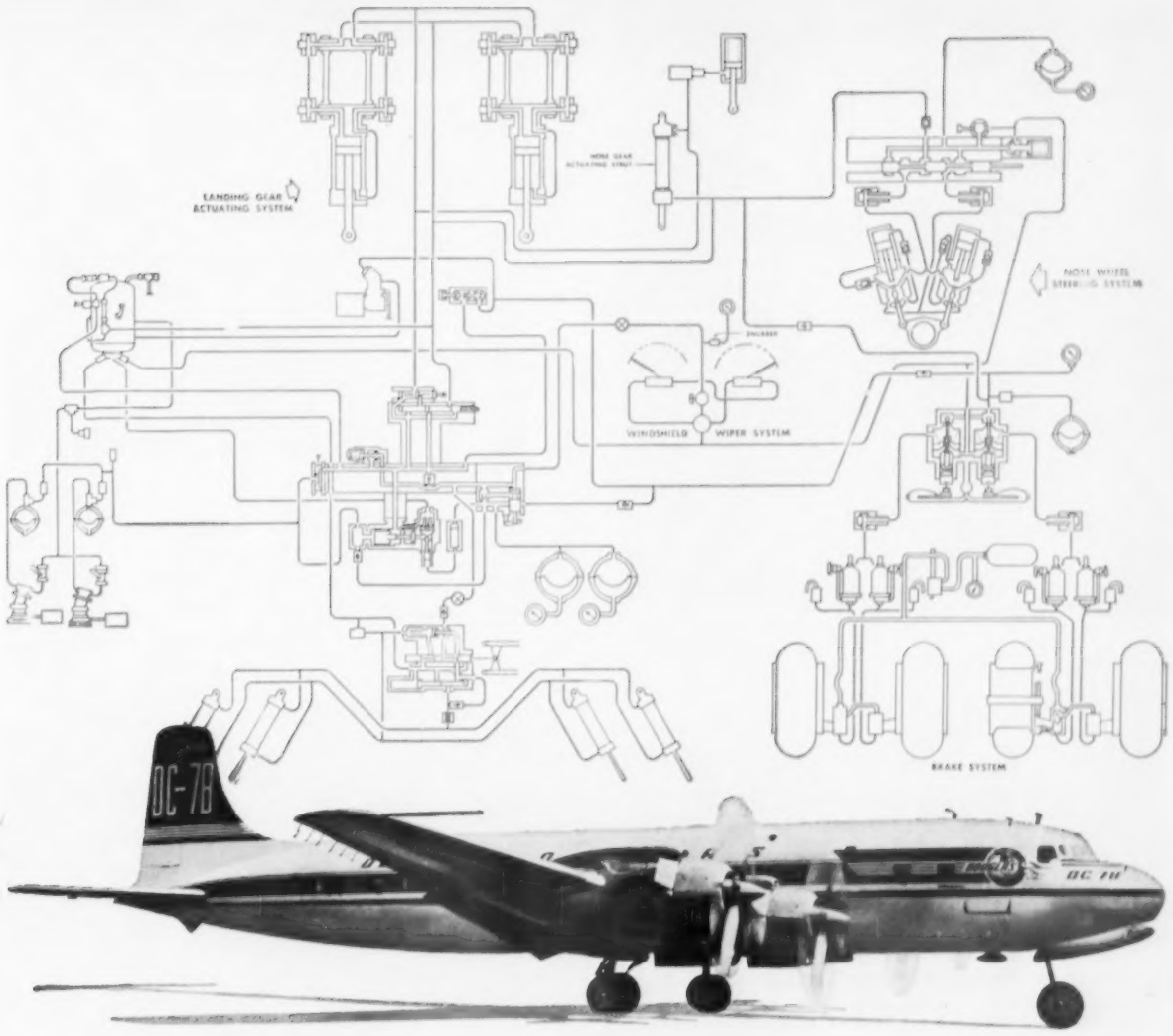
B. F. Goodrich Chemical Co., Cleveland, Ohio, has announced "Hycar 1072X3", a new carboxylic elastomer. Hycar 1072X3 is a medium high acrylonitrile-butadiene polymer basically similar to Hycar 1042, but it has been modified to include carboxylic groups in the polymer chain. The company states that this modification of the molecule has a considerable effect on the polymer chain. Changes are most apparent in the reaction of Hycar 1072X3 with curatives, the physical properties of the vulcanizates, and the compatibility of the rubber with plastic materials. The difference in the physical properties of Hycar 1072X3 and Hycar 1042 is developed only in formulations that contain zinc oxide or other metallic salts among the curing ingredients. A recipe containing curatives but no zinc oxide will produce little variation between these two polymers. However, Hycar 1072X3 cured with zinc oxide, sulfur, and accelerator has higher tensile strength, modulus and hardness than Hycar 1042. It has better tensile and tear properties at elevated temperatures, and superior low temperature brittleness values. On heat aging, Hycar 1072X3 retains most of its tensile strength but loses elongation and tends to become harder.

Polyurethane Foam Device

The O-Cel-O Division of General Mills, Buffalo, N. Y., has introduced a new automatic facility for the production of polyurethane foam. The new device, called the "Plastifoamer", was invented in the O-Cel-O Research Laboratories and is said to assure high quality production through the careful control of mixture of components. The facility is said to give the manufacturer complete control of porosity, density and color because it always assures exact mixture of components which can be changed to conform with specific demands of any industry. Whenever the mixture is incorrect, the machine automatically turns off. The introduction of the machine, said to have the capability of performing more than 100 individual mixing operations automatically, has launched O-Cel-O into the manufacture of polyurethane foam. The polyurethane foam, called "Plastifoam" is manufactured in a wide range of sizes and shapes.

Wyandotte Chemicals Expanding

Wyandotte Chemicals Corp., of Wyandotte, Mich., has announced a 32% expansion program of its soda ash facilities. The increased capacity is the result of changes in process, equipment modernization and rebuilding of the existing plant. This change will make it possible for Wyandotte Chemicals to stay ahead of customer demand for a number of years, officials state. It is estimated that there will be an annual demand of 60,000,000 tons by 1960, an increase of 20% over today's requirements. It is expected that the expansion program will be completed within the next few months.



Enjay Butyl rubber— vital artery in newest airliners

Douglas chooses Enjay Butyl for rubber components of the hydraulic systems in many of its famous DC-7 airliners. These components, which help assure the dependable operation of everything from wing flaps to landing gear, are proving over millions of air miles their durability and resistance to wear.

Versatile Enjay Butyl rubber may well have a place in *your* operation. It will pay you to investigate the many technical advantages it has over other types of rubber. Its price and ready availability are advantages, too. For full information, and for technical assistance in the uses of Enjay Butyl, contact the Enjay Company today.

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ENJAY *Pioneer in Petrochemicals*

ENJAY COMPANY, INC., 15 West 51st Street, New York 19, N. Y.

Other offices: Akron • Boston • Chicago • Los Angeles • Tulsa

Enjay Butyl is the super-durable rubber with *outstanding* resistance to aging • abrasion • tear • chipping • cracking • ozone and corona • chemicals • gases • heat • cold • sunlight • moisture.

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If you compound rubber, *low cost* PANAREZ hydrocarbon resins offer definite advantages. These softeners are available in any color from Barrett No. 1 to 18, and softening point from 40°F. to 300°F. They are supplied in flaked or solid form. Immediate delivery.

Compounds containing PANAREZ RESINS show these characteristics:

- **Improved color and color stability**
- **Improved extrudability**
- **Improved flex-crack performance**
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- **Improved ozone resistance**
- **Improved tear resistance**
- **Improved tensile strength and elongation**

No change in compounding technique is required when switching to Panarez resins.

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HYDROCARBON PANAREZ RESINS

PANAPOL Hydrocarbon drying oils

PANASOL Aromatic solvents

Overseas

by Reuter's

Djakarta—Some 400,000 estate workers in Java, Sumatra, Borneo and the Celebes were ordered by their unions to stop work on September 30. The order followed the breakdown of talks between the unions and representatives of the estates on the payment of a bonus for 1955.

—•—

London—Rubber traders point out that the permission granted by the government to import up to 80,000 tons of synthetic rubber in 1957 does not mean that this quantity will be imported. They add that this year's allocation of 70,000 tons will probably not be fully taken up.

—•—

Peking—Members of the Singapore and Malayan trade delegations express confidence that their missions have resulted in the re-establishment of rubber trading with China. The Chinese Import Corp. has already signed initial contracts to purchase a total of 3,200 tons of rubber from individual firms in Singapore and Malaya.

—•—

New Delhi—A scheme for bringing more land under rubber is now being examined by the government of India. A recent plan proposed by the Rubber Board involves an extension of rubber cultivation by 100,000 acres over a period of ten years. The Board also proposed that the government should grant a long-term loan at the rate of 750 rupees per acre.

—•—

Pusan—A company in this Korean city has begun the manufacture of truck and bus tires. Since the Communist invasion, only bicycle tires had been produced. Production is expected to be at the rate of about 100 tires per day for several months and then be doubled.

—•—

London—Dunlop Rubber Co. has decided to dispose of the Latex Corp. of Ceylon, Ltd. The corporation was set up by Dunlop in 1951 to provide concentrated latex on the basis of production plans for "Dunlopillo" products. A spokesman noted that the latex company had never been able to reach its full economic capacity and for some time had been working at a reduced rate.

With the September issue, RUBBER AGE initiated a new method of presenting foreign news developments under the heading "Overseas." While we have always paid full attention to foreign news, we have now undertaken, through the exclusive services of the Reuter's News Agency, to considerably expand this coverage as an added service to our readers. Through the world-wide facilities of the Reuter organization, we will be able to add a new dimension to the reporting of news vital to the rubber industry. Foreign items of interest will continue to appear in our regular news columns as well as in the "Overseas" columns.

ANOTHER SERVICE

Now PARACRIL controls the "power" in power steering!

The "power" *is oil.* Keeping it in its place and working for you *can* be difficult. *Unless,* as one major manufacturer discovered, you put oil-resistant PARACRIL® on the job.

"O" rings made of this versatile chemical rubber are...

- completely impervious to hydraulic oils
- molded to close tolerances...non-swelling and non-shrinking to retain their close fit indefinitely
- *flexible* enough to seal at low pressures...*tough* enough to seal at extremely high pressures
- functional over a wide temperature range
- resistant to abrasion from metal parts in contact with them.

In brief, these Paracril "O" rings are *leakproof* and *lasting!*

And Paracril has proved its superiority in *hundreds* of similar applications. In automatic transmissions and other power units, in hydraulic hose, oil field equipment, and wherever oil, temperature, or friction raises a problem, Paracril supplies the answer.

Available in varying grades of oil resistance, in bale or crumb form, Paracril may be blended with other rubbers or resins, used wherever a rubberlike material is needed.

If you're not already familiar with the *many* advantages Paracril offers *you,* simply write on your letterhead to the address below.

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OVERSEAS (CONT'D)

Kuala Lumpur—A new $5,000,000 (Malayan) replanting scheme provides for more rubber nurseries with the aim of providing a pool from which smallholders can obtain high-yielding plants for replanting.

—•—

Djakarta—Reductions in the export premium of rubber were announced by the Indonesian government as a complex new series of import-export regulations went into effect. The export premium has been reduced from 8 to 5% of the f.o.b. value for processed rubber and from 3 to 2% for unsmoked sheet.

—•—

London—A new £1,750,000 plant for the production of styrene monomer is to be built by Petrochemicals, Ltd., an associate of the Shell Chemical Co. At present, U.K. production of monomeric styrene is not sufficient to meet demands and imports are made from dollar areas.

—•—

Singapore—Spokesmen for Malayan and Singapore rubber trade circles have protested against the decision of the British government to allow United Kingdom importers to buy an additional 10,000 tons of synthetic rubber next year. It was said that this is a new blow to Malaya's rubber industry.

—•—

London—The capital of the International Synthetic Rubber Co. is being increased to £4,000,000. Formed last November by Dunlop, Goodyear, Firestone and Michelin, the new company will produce general purpose synthetic rubbers in the United Kingdom. The four sponsoring companies have already agreed to subscribe the capital with Dunlop the predominant partner.

—•—

Kuala Lumpur—Local officials are apprehensive that the Suez Canal crisis may adversely affect natural rubber competition with synthetic. It is felt that western manufacturers will either be inclined to pay more for natural rubber or alternatively use a little more synthetic.

—•—

London—Dunlop Rubber Co. has announced the formation of a new company, Dunlop Footwear, Ltd., in which will be concentrated the large and expanding activities of the factories and branches of the Footwear Division in home and overseas markets.

—•—

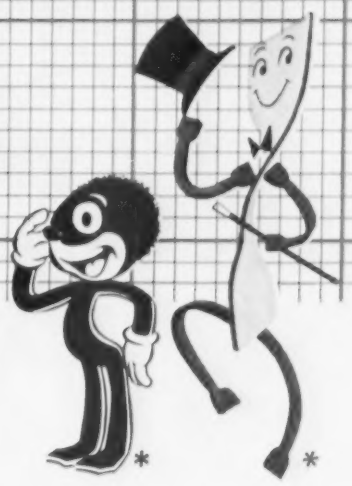
Singapore—The Singapore Chamber of Commerce attributes the recovery of the Malayan rubber market in the first half of this year to the removal of the ban on exports to China. Earlier, it appeared as though a repetition of 1953 was inevitable and the outlook was distinctly gloomy. The lifting of the ban, however, has set off a chain reaction.

—•—

Rio de Janeiro—Brazil will continue the importation of large amounts of rubber from Asian countries until such time as its own synthetic rubber plants are in operation. Brazilian rubber consumption, stimulated by rapid industrial expansion, rose to 44,000 tons in 1954 from 17,000 tons in 1946.

Philchem

RUBBER CHEMICALS
NEWS ITEM NO. 5



Introducing PHILPRENE* VP RUBBERS . . . for your Oil-Resistant Compounds

Philprene VP Rubbers open new fields of application for oil-resistant compounds. This new family of polymers, when quaternized with a suitable organic halide, affords a wider variety of desirable characteristics in rubber products for oil and solvent service.

Philprene VP stocks, when properly compounded and quaternized, have unique resistance to oils and solvents *plus* excellent flex life, low electrical resistivity, low volume swell and superior high temperature performance. These qualities will be of especial importance to manufacturers of hoses, gaskets and other rubber parts used by automotive and aircraft industries.

Philprene VP compounds, reinforced with carbon blacks, inorganic clays or silicas, can be "tailored" to your specific applications. Physical properties of Philprene VP polymers compounded primarily for oil resistance are tabulated below.

Test Samples Available

Philprene VP polymers are available in limited commercial quantities. For technical aid on processing and recipes, call your Phillips technical representative. Write for our technical brochure "Philprene VP Rubber In Oil-Resistant Compounds."

SUMMARY OF PHYSICAL PROPERTIES

	PHILPRENE VP-15	PHILPRENE VP-25	PHILPRENE VP-A
Original			
Tensile, psi	2320	2540	2350
Elongation, %	190	185	285
Shore A Hardness	75	80	68
Resilience	46	40	52.4
Gehman Freeze Point, °F	—80	—56	—49
Heat Build-up, △ T °F	72.4	74.7	74.7
Blowout, min	>60	>60	>60
Blowout, △ T °F	122.7	124.5	132.0
Aged 2 Days in 70/30 Isooctane/Toluene at 158°F			
Volume Swell, %	44.4	37.6	18.9
Extracted, %	8.8	9.1	8.7
Aged 3 Days in Turbo Oil-15 at 300°F			
Tensile, psi	570	590	500
Elongation, %	70	60	70
Volume Swell	21.3	18.6	19.4

Basic Compounding Recipes

Philprene VP-15 or VP-25	100	—
Philprene VP-A	—	100
MT Black	150	150
Zinc Oxide	5	5
Stearic Acid	1	1
Sulfur	0.25	0.25
Benzothiazyl Disulfide	3	3
TM Thiuram Disulfide	2	2
B-L-E	3	3
Plasticizer SC	20	20
p-Xylene Hexachloride	10	5

Cure: 45 minutes at 307°F

PHILLIPS CHEMICAL COMPANY
Rubber Chemicals Division
318 Water Street, Akron 8, Ohio

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Modify flexibility of latices

with **MONSANTO STYRENE EMULSIONS**

and erase one mixing step

What distinguishes the Monsanto specially formulated styrene emulsions is their optimum particle size. That's why you can combine these emulsions with your latices (synthetic or natural) at the same time that pigments and fillers are added. There's no extra mixing step.

Monsanto styrene emulsions also allow complete control of the rubber-to-styrene ratios you pre-determine. You'll find them easier to use in modifying the flexibility characteristics of the basic compounds used in the manufacture of many products—including baby pants, surgical gloves, adhesives, raincoats, girdles, foam rubber, upholstery fabrics and rug underlays.

Write for prices, data sheets and laboratory samples, to Monsanto Chemical Company, Plastics Division, Room 952, Springfield 2, Mass.

MONSANTO®

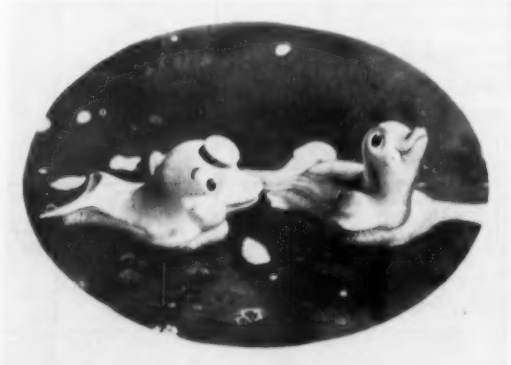
New Goods

Electriduct Extension Cord

Ideas, Inc., 615 South Second, Laramie, Wyo., has introduced an over-the-floor electrical extension duct made of rubber for use in offices, homes and places where an electrical outlet is needed in the middle of the room. "Electriduct" is stumble-proof and unobstructive; office equipment on casters rolls over it easily, the company reports. One end of the extension is plugged into a wall outlet and the other end has a two-way receptacle. The duct is 2¼ inches wide at the base, which rises from a feather edge to an apex of 7/16 inch. Ribs on the underneath side prevent slipping on the floor, and the enclosed wiring is safe from moisture. The complete duct system ready to plug into a wall outlet is available in standard 4, 5, 6 and 10 foot lengths. Special lengths are also available for custom installations.

Oak Rubber Bath Toys

Porpy the Playful Porpoise and Sammy the Slippery Seal, new tub toys made by the Oak Rubber Co., Sycamore Street, Ravenna, Ohio, are said to have captured considerable interest at the recent New York Toy Fair.



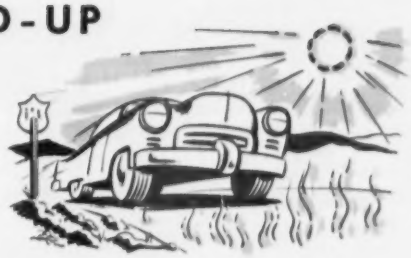
Lifelike and decorated with colors that will not wash off, the two toys float easily on water and are described as "so coy and intriguing they make taking a bath a pleasure for the little tots." Inside each of the toys is a tinkling bell for additional amusement. The toys are individually packed in polyethylene bags.

for less than 2¢ per tire

CIRCOSOL-2XH...

Helps Prevent HEAT BUILD-UP

Increased speeds have intensified the problem of heat build-up caused by flexure. By using Circosol-2XH® you get a more resilient rubber. This higher resiliency reduces hysteresis...lessens heat build-up...gives longer tire life.



Helps Eliminate TIRE SQUEAL

Squeal is a tread-design as well as a tread-compounding problem. The controlled balance of naphthenic and aromatic hydrocarbons in Sun's Circosol-2XH may answer your compounding problem...and...do it without sacrificing abrasion resistance or toughness.

Helps Make TIRES TOUGHER, SAFER

Circosol-2XH will give you tougher, more resilient rubber needed to make safer tires. Tests show that tires made with Circosol-2XH can take more impacts and a rougher all around beating than tires made with softeners of different composition.

And... CIRCOSOL-2XH IS ECONOMICAL

The cost of these extra advantages is low. Enough Circosol-2XH for an 8.00 x 15 size, 100 level tire costs less than 2¢ more than the cheapest softener you can buy. Get the full story on both the advantages and the low price of Circosol-2XH from your Sun representative. Or write SUN OIL COMPANY, Philadelphia 3, Pa., Dept. RA-10.

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these pure light red iron oxides
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They represent the ultimate in red iron oxide colors for the rubber industry.
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If you haven't already done so, try these finest of all iron oxide colors. Your own tests will show there is no equal for Williams experience.

LET WILLIAMS PUT THE MICROSCOPE ON *Your* COLOR PROBLEM
Whatever your color problem, bring it to Williams. Our 75-year experience can often save you time, money, and headaches in proper color formulation.
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Flexible Handle Dust Mop

A new dust mop, the "Handiflex Mop," with a flexible handle made from Geon polyvinyl material, is being marketed by the Virginia Plastics & Chemical Co., Roanoke, Va. The Handiflex Mop bends easily to permit the user to get the mop head under hard-to-reach places.

The mop handle is extruded in rigid form with a long-lasting, built-in color. There is no chipping or peeling of paint such as is associated with conventional mop handles, according to the manufacturer. Another feature reported by the company is that the vinyl material in the handle minimizes scratching of furniture.

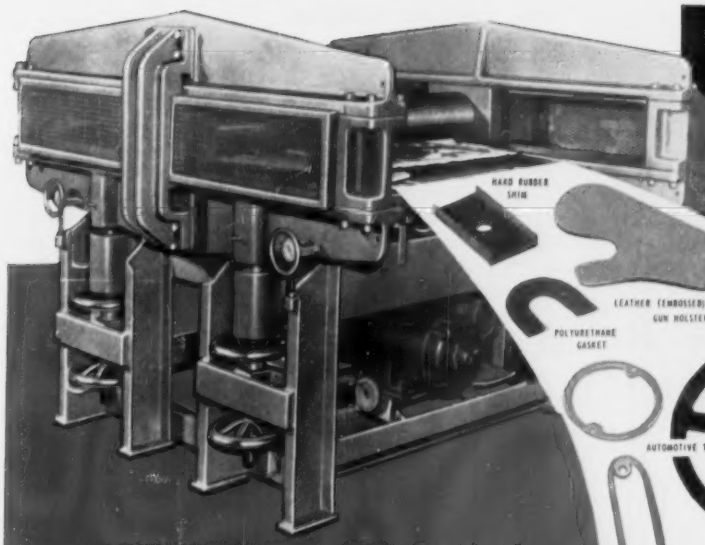
Webb Neoprene Tarpaulins

Webb Manufacturing Co., 2904 N. Fourth Street, Philadelphia 33, Penna., is now producing a new line of neoprene-coated nylon truck tarpaulins that can be handled by one man, even when wet. The fabric for the tarpaulins, coated by the Aldan Rubber Co., Philadelphia, is completely waterproof and lightweight, the company claims. Also, when not in use, these covers require less storage space than the conventional canvas covers. The new fabric has made possible a new method of roping whereby the ropes are secured through metal grommets, spaced so as to make it possible to load or unload materials from a section of a flat truck without removing the entire cover.

Sponge Carpet Cushions

Two new sponge rubber carpet cushions are now being manufactured by the U. S. Rubber Co., 1230 Avenue of the Americas, New York 20, N. Y. Both carpet cushions are luxurious in feel, permanently resilient, easy to lay and clean, remain insect free and guarantee longer wear for all carpeting, U. S. Rubber states. The first of the new sponge carpet cushions, "U. S. Luxuryliner" is produced in both 36 and 53 inch widths and is made of a thick, highly resilient sponge compound with a strong fiber backing. The second type, "Skyliner", has a special design to give it strength and resiliency and help air circulate freely under the carpet. It is 53 inches wide.

..from "A" to "Z" in Die Cutting with FEMCO'S Roller Die!



IT'S VERSATILE, FAST AND ACCURATE! . . . IT'S THE WAY TO END *YOUR* DIE CUTTING PROBLEMS!

FEMCO'S Heavy Duty Roller Die Machine cuts many products and materials and here's proof! *17 different items* that are being successfully cut out of *several different materials* by firms all over the country! We could show many more if space permitted — but here's a good cross-section that proves the versatility of this labor saving, cost saving machine!

The FALLS ENGINEERING AND MACHINE CO.

Established 1917

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SEND US YOUR MATERIALS FOR TRIAL CUTS AND FULL REPORT . . . NO OBLIGATION!

You learn in advance of purchase just what our machine will do on your particular stock cutting job. Write or wire us today!

Improved Performance

for Neoprene Compounding

- **Better Curing**
- **Better Physicals**

GENMAG MLW

Magnesium Oxide

Bulk Density	18-22 Lbs.
Moisture	Nil
MGO (Ignited Basis)	97.9%
Chlorides	Nil
Manganese	.0003%
Activity	Moderate

General Magnesite
& MAGNESIA COMPANY

P. O. Box 671 - Norristown, Pa.

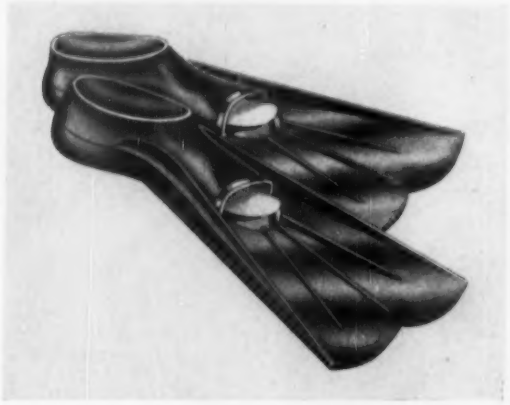
Jason Sealtuft Quilted Vinyl

Jason Corp., 1040 Grand Street, Hoboken, N.J., is offering an electronically quilted vinyl plastic in a variety of patterns and colors. Basically, "Jason Sealtuft" is a "sandwich" with a vinyl face, vinyl back and a filler of cellulose or synthetic batting in between. The three layers are welded together electronically in a variety of patterns — floral, geometric, spaced, striped, novelty effects and traditional quilting designs. In addition to

the variety of patterns and more than 85 colors, the quilted vinyl is made in a number of different weights and textures. Stitchless Sealtuft is water-proof, according to the manufacturer, and cleans easily with a damp soapy cloth. There are no threads to break or discolor, and it can be sewn, tacked, stapled or glued. Since it is electronically quilted, Sealtuft's puffy appearance is permanent, Jason claims. Most materials are produced 54 inches wide; wider goods can also be made to order. A typical application of the material is shown above.

Flying Fish Fins

Martin Rubber Co., Long Branch, N. J., has introduced a new line of swim fins under the name of "Flying Fish Fins". These European-type fins are rigid in the propelling surface and flexible and soft in the foot



part and are made of glossy black stock. The fins are available in large and medium sizes. Martin Rubber has also introduced a companion item, the "Flying Fish Mask" which has a stainless steel retaining band with a stainless steel take-up nut.

POLYSAR can help to solve your rubber problems.

Why?

Because Polysar's quality, uniformity and customer service plus the wide variety of Polysar types enable you to select the best rubber for the job.

Polysar is available in the following types:

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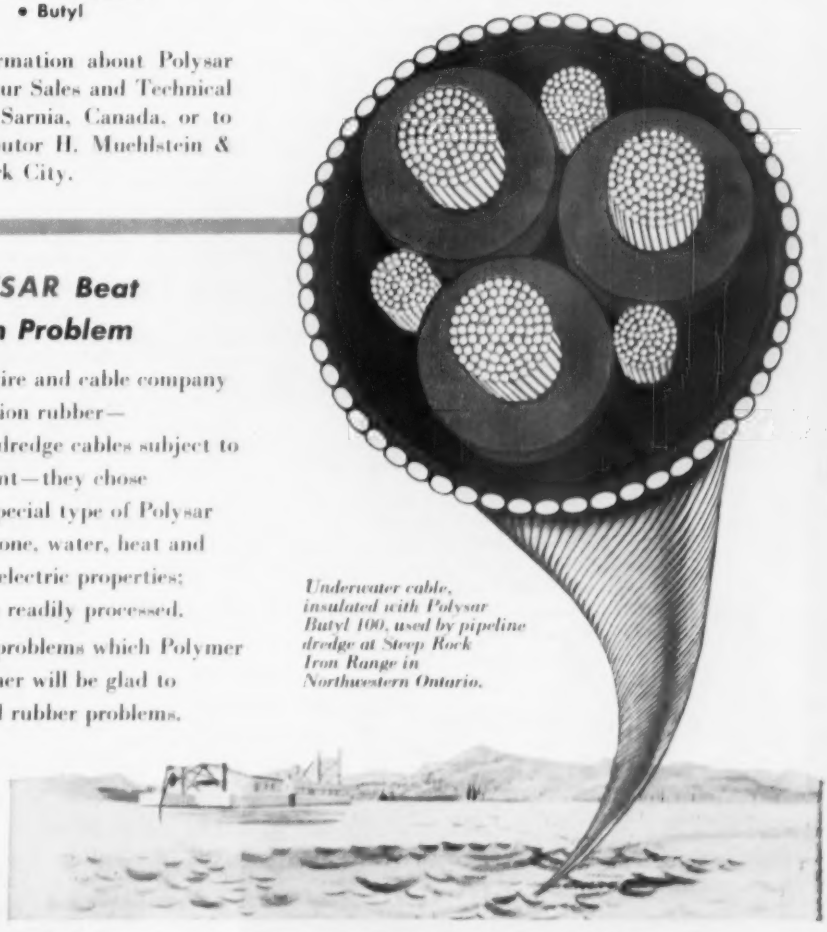
- Special Purpose
- Latices
- Oil-resistant
- Butyl

For detailed information about Polysar rubbers write to our Sales and Technical Service Division, Sarnia, Canada, or to our U.S.A. distributor H. Muehlstein & Co. Inc., New York City.

Here's How POLYSAR Beat a Critical Insulation Problem

When a large Canadian wire and cable company was looking for an insulation rubber—to be used in underwater dredge cables subject to extremely rugged treatment—they chose Polysar Butyl 100. This special type of Polysar gives high resistance to ozone, water, heat and cold; provides excellent dielectric properties; has good flexibility, and is readily processed. This is only one of many problems which Polymer has helped to solve. Polymer will be glad to help you with your critical rubber problems.



Underwater cable, insulated with Polysar Butyl 100, used by pipeline dredge at Steep Rock Iron Range in Northwestern Ontario.

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REGISTERED TRADE MARK

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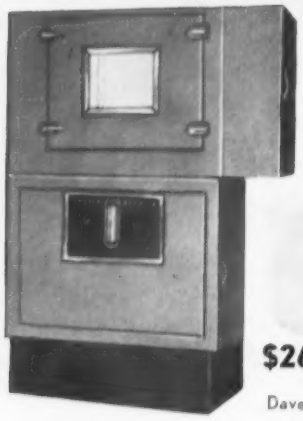
Sarnia, Canada

Distributors in 28 Countries Around the World

Model 700-1
OZONE
TEST CHAMBER



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SPECIFICATIONS

Ozone Concentration Range: 15 to 1,000 pphm
Temperature Range: 5° below ambient to 200° F ±1° F.
Air velocity over sample: 2 feet/second
Chamber dimensions: 20" x 20" x 25" (5.7 cubic feet)
Floor space required: 54" x 28½"
Power requirements: 110-115 volts, 60 cycle, AC

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Hofran Baseballs And Softballs

Patching baseballs with heavy black tape is becoming a lost art on the sandlot as Hofran, Inc., Tampa and Washington Streets, Tampa 2, Fla., is making available to "Little Leaguers" and Junior Leaguers balls that are claimed to be resistant to sandlot, playground and street scuffing and skinning. According to the company, rubberized cord covers made with Pliolite S-6B rubber reinforcing resin account for much of this improvement in hardballs and softballs. Pliolite S-6B contributes to more durable covers by providing moisture-proof surfaces that are scuff and skin resistant. The resin also helps provide an easy-grip surface which helps youngsters gain better pitching and throwing control, the company states. Because moisture cannot be absorbed, thus distorting the shape of the ball, the cover can be washed repeatedly and the "white" look so necessary for twilight and night play can be retained. Two major types of baseballs are made by Hofran: the "Park Special," which is made especially for youngsters, and the "All American" for more advanced players. Both are official size and weight and have cushioned cork centers. The Hofran softball also is official size and weight and possesses the same durable qualities.

Goodrich Vibrasorb V-Belt

A new type of rubber V-belt, featuring a built-in spring action, has been developed by the B. F. Goodrich Industrial Products Co., Akron, Ohio. The new belt, known as "Vibrasorb," is said to reduce both vibration and noise level by more than 40% on evaporative air-cooling equipment and to absorb 24% more vibration than belts presently rated as low vibration belts. Vibrasorb belts absorb shock so that little or no vibration is permitted to reach the framework of equipment. By isolating and absorbing vibration, the belts minimize the transmission of vibration from one pulley to another, the company stated. Field tests made by the manufacturer of evaporative cooling equipment show that the ability of Vibrasorb V-belts to absorb vibration increases the life of both belts and pulleys. Flex life of the belt is said to be 90% greater than that of standard V-belts. Vibrasorb belts are available only to equipment manufacturers at this time.

Goodyear Single-Type Rim Valve

A new single-type rim valve that is reported to replace 16 different valves previously required to do the job has been introduced by the Metal Products Division, Goodyear Tire & Rubber Co., Akron, Ohio. Adaptable to any Goodyear tubeless highway rim, the two-inch unit reduces cost, down-time and inventory for the smallest truck to the biggest earth-moving vehicle, the company states. The valve can be threaded into the rim wall of a disc wheel or adapted to any size of the Drop Center Tubeless truck and Tru-Seal over-the-road rims merely by varying the location of the valve hole. Used in the latter instance are two simple adapters, one of which is used on 5.25 to 6.00 rims, the other, longer adapter on 6.75 to 8.25 rims. Easy to handle, the new valve has a minimum of parts which assures maximum speed in assembly.

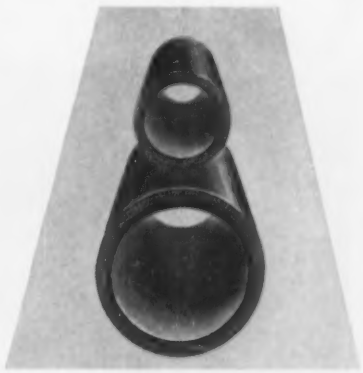
Wider range of high-strength yarns and fibers than any other brand

American Viscose Corporation, the nation's largest producer of rayon, manufactures a wider range of high-strength yarns and fibers than any other company.

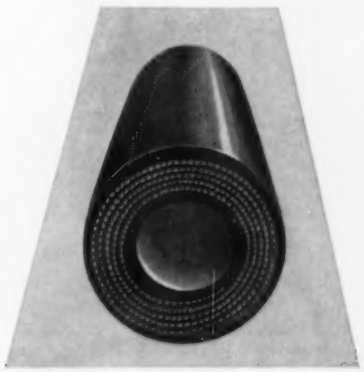
Here are a few of the hundreds of applications of AVISCO rayon that make industrial products stronger, more versatile, longer lasting:

Rayon chafer fabric woven from continuous filament Rayflex yarn or high-strength Viscose 32-A staple yarns.

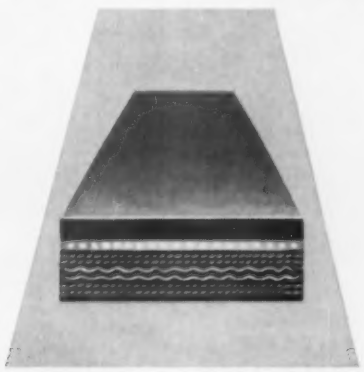
Garden hose — rubber or plastic — reinforced with either knit or braided rayon tire yarn for high strength, durability.



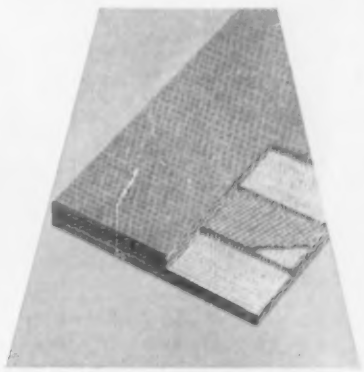
Automobile heater and radiator hose reinforced with knitted high-strength tire yarn.



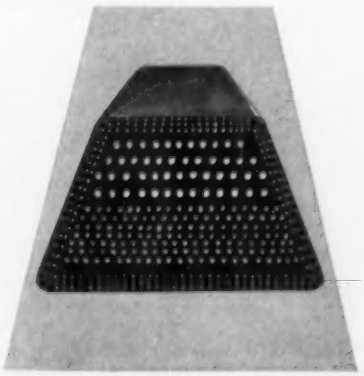
Spiral-wrapped hose made from fabric woven from Viscose 32-A high-strength staple. Wide range of uses wherever high bursting strength is required.



Conveyor belt reinforced with Super Rayflex rayon in cord or duck construction. Also made with fabric of Viscose 32-A high-strength rayon staple.



Heavy-duty power transmission belt with multiple plies of Super Rayflex for maximum strength and high operating efficiency.



V-belt, constructed of layers of tire fabric or individual cords.

We would be happy to discuss with you how you can use AVISCO rayon to strengthen your business.

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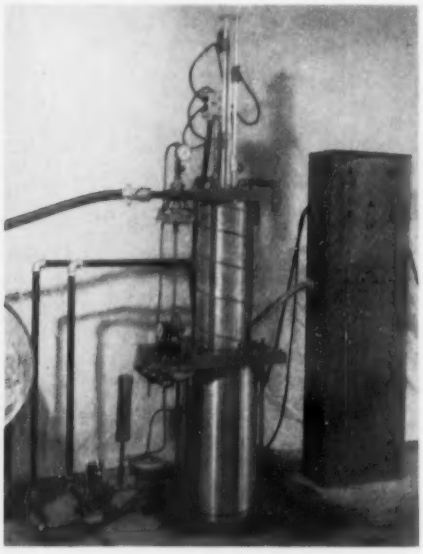
New Equipment

C B Measurite Proportioning Unit

A new automatic device for accurately proportioning and dispensing liquid compounds into rubber and plastic mixers has been introduced by the New England Engineering Co. of Derby, Conn. Use of pneumatic principles insures uniformity of batches and allows the utilization of one to four fluid compounds, each separately controlled. Liquids are completely purged from machine and lines after each use, consequently there can



be no contamination when batch requirements are changed, the company states. A steam coil on the chamber keeps high viscosity fluids at the same consistency as they are stored. This machine can be used in conjunction with any available storage tank. An alarm system notifies the operator if the incorrect amount of proportion is in the chamber. This is useful in case of reservoir failure. Chromed cylinder and piston rod are highly resistant to caustic compounds.

Presently available in 4.6 gallon capacity, a complete cycle time for a unit of this size is 30-45 seconds, depending upon viscosity. However, since the machine refills automatically there is always available in the chamber the correct proportion of compound liquids ready to be pumped into the mixer. To allow for correct dispersion in the mixer chamber, all or any part of the liquids can be introduced at any time into the mixer. Completely automatic, the controls can be mounted anywhere convenient for the mixer operator.

A light duty edge guide control for web-handling equipment of the smaller type has been announced by the Askania Regulator Co., 240 East Ontario St., Chicago 11, Ill. According to the company, the new **Model 500 Edge Guide Control** comprises a complete package which can usually be installed by plant mechanics. It is said that only a few short lengths of pipe are needed to set up web guide control for payoff or unwind, wind-up or steering rolls.

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Free working samples of Calcene®—as well as Columbia-Southern's other exclusive pigments, Silene® and Hi-Sil®—are available upon request. Write or call Pigments Department, Columbia-Southern Chemical Corporation, One Gateway Center, Pittsburgh 22, Pennsylvania.

PROPERTIES AND CHARACTERISTICS

Calcene is a fine particle, precipitated calcium carbonate. It provides low modulus, good tensile strength, high hot tear resistance, good abrasion and excellent processing.

Calcene is used extensively in the rubber industry for the production of inner tubes, heels and footwear, drug sundries, wire and cable insulation, and other goods.

Calcene is supplied in two forms: Calcene TM (surface coated to increase ease of dispersion) and Calcene NC (non-coated).

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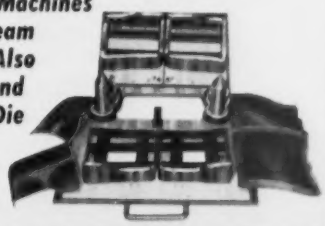

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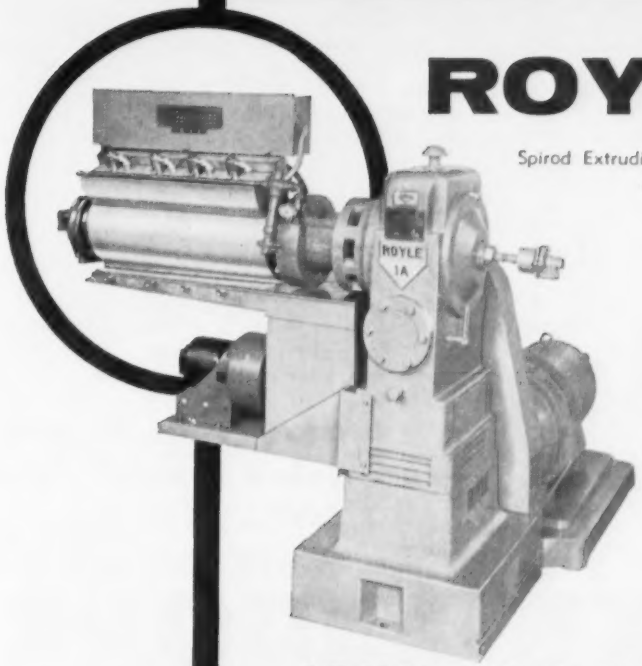
ROYLE 1A (2½" cylinder bore)

Spirod Extruding Machine with electric heating and high velocity evaporative cooling. An all-purpose extruding machine for processing rubber and plastics. Available in sizes 1⅛" through 12" cylinder bore.



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Here at last is the answer to your problems of dicing rubber or vinyl sheet stock. Produces perfect cubes ranging in size from ⅛ to ½" by merely changing knives.

Comes in two sizes designed to handle sheets up to 7" or 14" in width. Other sizes made to order.

Input speeds range from 10 to 125 feet per min. depending on material and size of cube desired.

The CUMBERLAND Rotary Chopping and Dicing Machine

As a chopper, this machine efficiently cuts rubber and vinyl slabs into small pieces. Two sizes available to handle stock widths up to 14 or 24 inches.

As a dicer in modified form, handles principally vinyl sheet stock. A less expensive machine though less universal than the "Stair-Step" Dicer shown above.

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Dunlap Friction Meter

A new friction meter that is said to be simple to use and suited for hand tests, in which one body held in the hand is caused to slide over the other, has been marketed by Nash and Thompson, Ltd., Oakcroft Road, Chessington, Surrey, England. Called the Dunlop Friction Meter, the apparatus is so designed that the coefficient of friction is indicated directly upon a scale which is calibrated from zero to infinity. The basic mechanism is a platform carried by four identical levers each with

a counter weight, and the whole system is in neutral equilibrium. All pivots are of low friction and the levers are arranged so that they are parallel at all angles, and in operation all take up a direction parallel to the direction of the resultant reaction between the two surfaces under test, one of which is the platform of the instrument. The coefficient of friction is the tangent of the angle between the levers and the vertical platform.

The instrument has been used in tests on rubber and rubberlike polymers in contact with highly polished plastic, glass or other smooth, hard and impervious surfaces, where maximum coefficients of about 2.5 were experienced. The bloom on the surface of the rubber tended to reduce the coefficient to values of the order of 0.25 and these were easily read on the calibrated instrument. Tests have also been made with the same materials on rough surfaces such as carborundum and concrete. Other suggested uses for the apparatus are the testing of leather or rubber shoe soling material on linoleum, asphalt flooring and floor tiles, and fibrous asbestos materials on steel (brake drums).

The General Scientific Equipment Co., Philadelphia, Penna., has announced the availability of the **Tripl-Duty Truk-Boy,** a device that is used in transporting and pouring acids and other dangerous liquids. The safety ratchet on the tilter has fingertip control and the air vent pouring spout is said to assure a splash-free flow.

An automatic program controller that will accommodate any number of operating functions has been announced by Taylor Instrument Companies, Rochester, N. Y. The unit, called a **Flex-O-Stepper Controller,** provides step actuation of solenoid switches and air valves in any combination to control a process program automatically.

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- SPECIAL lacquers for all types of rubber products.

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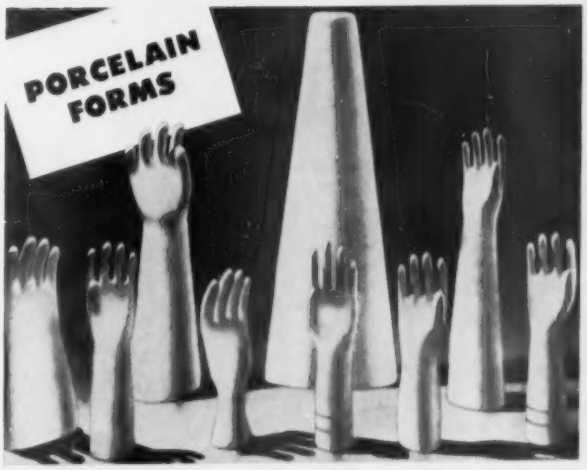

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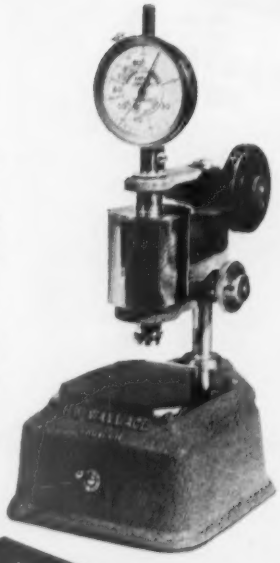
HARDNESS TESTER



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★ May be mounted on special base for direct use on rubber rolls.

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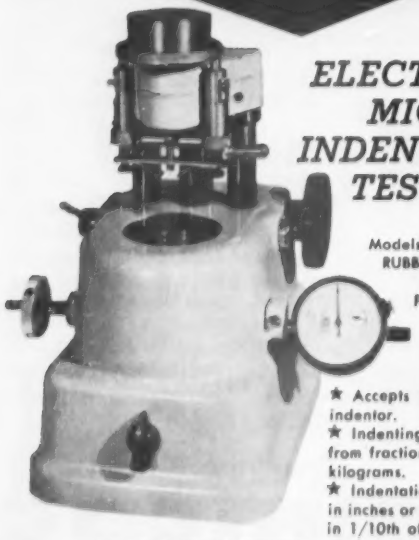

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Models are available for RUBBER, PVC, PLASTICS, RESINS, FILM and PAINT where thickness, shape or other considerations require a micro indentation.

★ Accepts any shape or size indentor.

★ Indenting dead weight load from fraction of a gram to 3½ kilograms.

★ Indentation depth measured in inches or millimeters to within 1/10th of a micron.

Ask for detailed information on these and other instruments.

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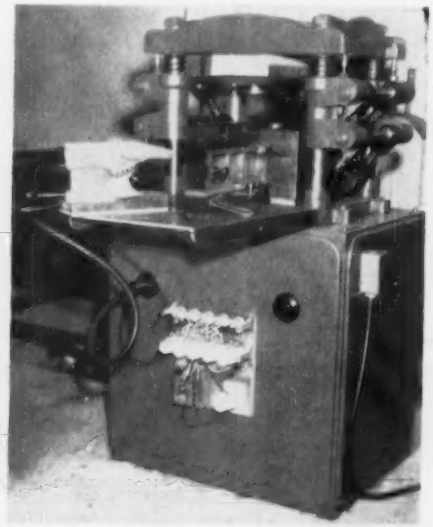
Goliath Automatic Shoe Vulcanizer

A new and improved model of an automatic shoe vulcanizer, called the Goliath Automatic Shoe Vulcanizing Machine, has been announced jointly by Gidley Laboratories, Inc., Fairhaven, Mass., and A. B. Svenska Skolastfabriken of Sweden. The machine is said to obsolete hand assembly, stitching, cementing and autoclave vulcanization of all types of footwear, including tennis shoes, sandals, leather shoes, basketball shoes, slippers, beach shoes and sport shoes. The unit operates on a



synchro-slide, producing uniform and powerful three-way pressure closure. All mold surfaces are electrically heated and accurately controlled by integral thermostats. An automatic cycle controller operates all three stages of the machine, functioning entirely independent of the operator. One operator can handle two machines and can manufacture better than a shoe per minute with proper layout and formulas. Separate warning signals alert the operator to any section of the shoe not receiving proper cure. The machine is available with an interchangeable alternative instrument panel, entirely manufactured of American electrical components, which may be locally obtained from any U.S.A. supply house, according to the company. Gidley Laboratories, Inc. has been appointed sales and technical service representative for North America for the Swedish machines.

Sardap TU-3A Gamma Gage

Designed as an automatic industrial process controller of the no-contact type, the Sardap TU-3A Gamma Gage, developed by the Nuclear Research Corp., Southampton, Penna., finds use where adverse temperature, pressure, humidity and corrosive conditions prevail. The system consists of three integral parts: (1) a source of gamma radiation; (2) a high efficiency detector of gamma radiation, and (3) an electronic system used for the instantaneous presentation of the information obtained from the detector. The particular material to be controlled, together with its thickness and density, including the tank wall thickness and density, determines the choice of radioisotopes (radioactive source) to be used.

Several different radiosotopes are available for use

with this system. Each source is housed in a steel-lined lead cylinder with a collimating aperture for producing a fine beam of gamma radiation. The gamma rays, after emerging as a beam from the source container and passing through the tank walls and fluid under control, are detected by a high efficiency gamma ray detector. This detector is of the modern scintillation counter type. Information received from the counter is presented in two different ways by the electronic section. A visual presentation of the condition of the gamma ray beam is made with front panel lamps, while a corresponding relay of 115 V.A.C. is provided through a rear panel connector. The panel lamps and relayed voltage can be adjusted to follow an "on-off" or "off-on" sequence of the gamma ray beam, as initiated by the conditions of the process under control.

With regard to problems in the rubber industry, there are two applications which are presently under discussion. One is the accurate density measurement of rubber in liquid form, which can be done to within 0.1% of the total density of the fluid, and the other is thickness gaging of finished rubber products.

Chemineer Rubber Cement Processor

Chemineer, Inc., 1044 East First St., Dayton 2, Ohio, has introduced a completely new mixing unit called the "Rubber Cement Processor." According to the company, greatly reduced mixing times for cement production are obtainable due to the close correlation of agitator design and vessel geometry. The vessels have a complete external shell jacket with special internal baffles to produce a two-pass coolant flow. Jackets are guaranteed to

provide sufficient cooling capacity to permit continuous processing. Agitators are one or two in number, depending on tank size and viscosity of cement. A specially designed high-shear turbine impeller imparts a maximum cutting action and, at the same time, produces the essential top-to-bottom turnover. The problems of a conventional stuffing box for shaft seal have been eliminated by the use of mechanical seals. It is said that the seals prevent the rubber cement from hardening up and galling the shaft. If desired, a two-speed motor can be supplied in the lower unit to allow milder action at the start of each batch. Explosion-proof, Class I, Group D motors are standard equipment. The unit is complete with all necessary operating accessories, including a flush-bottom valve, thermometer, vent and hinged, vapor-tight passageway.

Plastisol

These illustrations may spark a new sales development or product improvement for you.

Toughness, chemical resistance, wear resistance, tear strength and flexibility make these compounds outstanding as noise deadeners, wire coatings, flexible molded parts, textile coatings, sealing compounds, glove coatings and in many other applications.

If your product requires a soft plastic coating or a molded part you should consider the use of vinyl plastisols.

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Reviews

BOOKS

The Improvement of the Low Temperature Behavior of Natural Rubber Vulcanizates by Chemical Modification with Thiol Acids. (Communication No. 324). By F. J. Ritter. Published by Rubber-Stichting, P. O. Box 178, Delft, Netherlands. 6½ x 9½ in. 130 pp.

The work reported in this communication is part of the program of fundamental research on rubber conducted by the Rubber-Stichting and was also issued as a thesis which was approved by Dr. A. van Rossem. As indicated by its title, the work covers the improvement of the low temperature behavior of natural rubber vulcanizates by chemical modification with thiol acids and it stems from the investigation of possibilities for the attachment of bifunctional groups to the rubber molecule first launched by Rubber-Stichting several years ago.

The author first discusses the general laboratory tests for the low temperature serviceability of elastomers, the temperature-retraction test, and possible methods for a limited modification of natural rubber. He then launches into the preparation of thiol acids, the modification of natural rubber both in solution and in the dry state with monothiol acids, the modification of natural rubber latex with monothiol acids, and the cross-linking of natural rubber with bisthiol acids. A final chapter is concerned with theoretical considerations and additional experiments. Compounding formulas are covered in an appendix.

In his summary, the author claims that the modification of natural rubber with thiol acids is a suitable method for the limited introduction of foreign groups into the rubber molecule. Quantities of combined thiol acid as small as 0.5 to 2 mol/100 isoprene units bring about a considerable reduction of the tendency of the rubber to crystallize. These small quantities of combined thiol acid are said to have hardly any influence on the vitrification point of the vulcanized rubber.

•

The Chemistry and Technology of Waxes. (2nd Edition). By Albin H. Warth. Published by the Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. 6 x 9 in. 940 pp. $18.00.

This greatly enlarged edition of an already outstanding work presents the most thorough and complete picture of the entire wax industry from the natural to the applied science. The many new developments in wax research and technology since the first edition was issued in 1947 have been included, as well as new illustrations, charts, tables and literature and patent references. Chemists, technologists and others who require a knowledge of wax in their work will find the new edition an ideal reference source.

The book has ten chapters in all plus an appendix containing tables of physical constants of waxes and an addenda on the compounding of waxes. The various chapters cover the chemical components of waxes; natural, fossil, petroleum and synthetic waxes; commercial modified, blended and compounded waxes; emulsifiable waxes; methods for determining the constants of waxes, and, finally, the uses of wax in industry.

Many of the applications in the rubber field are covered in a relatively short section on "Wax in the Leather and Rubber Industries." This section furnishes some data on waxes as softening agents and mold releasing agents, use of hydrocarbon waxes in general, commercial agents for retarding deterioration, use in latex, and some direct commercial applications, as in belt dressings, dress forms and car stoppers. References in other sections pertain to rubber adhesives, finishes for rubber goods, molded goods, sponge rubber, and coatings of rubber-wax blends. Author and subject indexes are included.

ASTM Standards on Textile Materials (With Related Information). Published by the American Society for Testing Materials, 1916 Race St., Philadelphia 3, Penna. 6 x 9 in. 794 pp. $5.75.

The latest ASTM tentative and standard methods of test, specifications and definitions pertaining to textile materials are included in this book which was prepared by ASTM Committee D-13 on textile materials. Of the 118 standards and tentatives, 22 are new or revised since the previous edition of the book was published in October, 1954. Thirteen appendices cover several proposed test methods and recommendations: the Basic Properties of Textile Fibers; Psychometric Table for Relative Humidity; and the Yarn Number Conversion Table. In addition, the book contains the 1955 report of Committee D-13 on Textile Materials and a list of other publications and papers on textile materials. Specifications and methods of test cover testing machines; humidity testing; interlaboratory testing; identification and qualitative analysis; quantitative analysis; resistance to insect pests and microorganisms; fibers; yarns, threads and cordage; fabrics; hosiery; textiles made of asbestos, bast and leaf fiber, cotton, glass rayon, acetate, silk, and wool; and warp knit, pile, and non-woven fabrics. There is also an extensive index.

•

Latex: Natural and Synthetic. By Phillip G. Cook. Published by the Reinhold Publishing Corp., 430 Park Ave., New York 22, N. Y. 5 x 7 in. 232 pp. $3.50.

This is the latest edition of the Pilot Books Series currently being published by Reinhold Publishing. These books, which are new in format, new in approach, and relatively new in subject matter, cover various fields of science and technology as new developments occur. As indicated by its title, this latest pocket edition covers the natural and synthetic latices. Its purpose, as indicated by the author in his preface, is to show how both natural and synthetic types of rubber latex are produced, modified, and finally converted into useful products. It is not intended for the latex expert, but rather for the newcomers in the field, as well as for those in allied industries and students of industrial chemistry in general. Topics covered include production and importation, testing, vulcanization, compounding, processing and testing of compounds, synthetic rubber latices, rubber-plastic latices, and latex products. The latter is covered in two chapters, the first devoted to unsupported films or filaments and the second to coatings, binders and saturants. The author covers the various subjects in concise fashion and the book should prove especially useful to the tyros in the field. The author, Mr. Cook, is technical superintendent of the General Latex and Chemical Corporation.

•

Management in Action. By Lawrence A. Appley. Published by the American Management Association, 1515 Broadway, New York 36, N. Y. 5½ x 8¼ in. 382 pp. $3.50, members; $5.00, non-members.

Aptly subtitled "The Art of Getting Things Done Through People," this book falls into the how-to-do-it category, with emphasis on how to manage. The author has applied the experience of the operating executive and the knowledge and insight of the social scientist to arrive at answers that are significant to every executive who "gets things done through people." Divided into two parts, the first part treats with the spirit and character of an organization, the effective leader, the valley of decision, the management of men, the profit motive, the tools and techniques of management, and the making of a manager. Part Two covers such subjects as management the simple way, the meaning and future of professional management, and basic factors in organization development. The author, incidentally, is president of the American Management Association.

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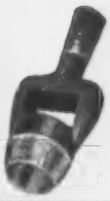

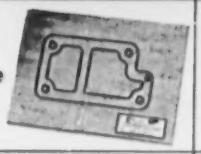

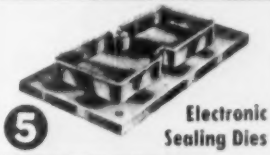

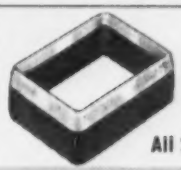

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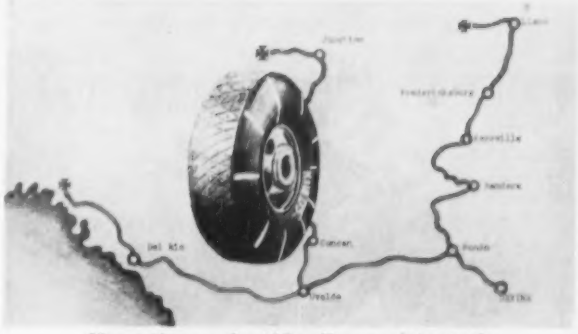

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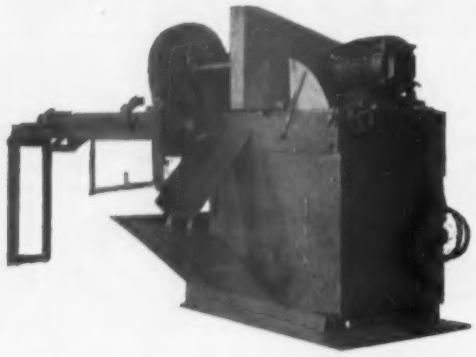

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BOOKLETS, CATALOGS, etc.

Chemistry of Acrylamide. Petrochemicals Dept., American Cyanamid Co., 30 Rockefeller Plaza, New York 20, N. Y. 8½ x 11 in. 40 pp.

This bulletin presents the physical and chemical properties of a new and interesting reactive vinyl monomer and bifunctional intermediate, acrylamide. Emphasis is placed on polymerization and copolymerization reactions. Attention is also directed to the many potential applications of the material, some of which are outlined in the bulletin. Included is information on the reaction of acrylamide with ammonia, amino compounds, sulfhydryl compounds, sodium sulfide, sodium bisulfite, aldehydes and ketones. Potential applications include the use of this material in adhesives, cements, dispersants and plasticizers. A discussion on the toxicity of the material is included as well as a bibliography.

•

Oilgear Directional Control Valves. (Bulletin No. 80300). Oilgear Co., 1587C West Pierce St., Milwaukee 4, Wisc. 8½ x 11 in. 16 pp.

Three- and four-way directional control valves for fluid power systems up to 3000 psi are described in this bulletin. Included are details of the valve body construction and the functions of standard and special plungers. The bulletin points out a wide choice of plungers and flanges offered in four styles of operators —mechanical, manual, hydraulic and solenoid pilot. Each style is described and the type designation, dimensions and J.I.C. symbols are included. A page on custom-built valves illustrates special directional control problems for such applications as steering gears, plastic injection molding machines and 4000 ton presses.

•

Penacolite Brittle Resins. (Technical Bulletin No. C-6-230). Chemical Division, Koppers Co., Inc., 1301 Koppers Bldg., Pittsburgh 19, Penna. 8½ x 11 in. 12 pp.

This bulletin outlines the physical and chemical properties and the various uses of Penacolite Brittle Resins B-1A, B-16, and B-22. Included are the minimum weight percents of these resins soluble in water at various pH levels at room temperature as well as the viscosities of solutions of each resin in various solvents. A description of these materials as to form, color and chemical composition is also given. In addition, typical properties, physical and cure characteristics, applications, and storage and handling recommendations are presented in detail.

•

Kirk & Blum Ovens for Industry. Kirk & Blum Mfg. Co., 3120 Forrer St., Cincinnati 9, Ohio 8½ x 11 in. 36 pp.

Photographs and drawings are profusely used in this catalog to illustrate the company's line of industrial ovens. Included are twin rock wool ovens and cooling tunnels, foam rubber dryers, battery plate dryers, metal tube dryers, permanizers and pharmaceutical product dryers; also ovens for testing, paper products drying, motor stator baking, automotive accessories, and a special pit-type oven for baking varnish on armatures. Also shown are ovens for plastisol research, production and application as well as ovens for finishing metal furniture, machine tools and process machinery.

•

Quick Selection Tables for Variable Speed Texrope Drives. (Bulletin No. 20P50). Allis-Chalmers Mfg. Co., 979 S. 70th St., Milwaukee, Wisc. 8¼ x 10¾ in. 44 pp.

Included in this booklet are multi-color tables for quick and easy selection of variable speed Texrope drives. In addition to providing selection tables for the variable speed drives, the booklet includes information on design features, drive principles, and horsepower rating tables for the various belt sections. A speed range table shows the variation in rpm when using two vari-pitch sheaves in combination with one another. Engineering information includes a discussion on the principle of operation of the drive as well as installation and maintenance of the equipment.

How to Choose an Extruder. (Bulletin No. E-3). Prodex Corp., King George Post Rd., Fords, N. J. 8½ x 11 in. 48 pp.

It is the object of this bulletin to present the design and performance features of the company's new line of extruders, and to compare them with those of other machines. The extruder components are examined in logical fashion from the rear of the machine forward. Illustrated descriptions of such extruder components as gear transmission, flexible coupling and thrust assembly, feed section, feed opening, cylinder, screw, length/diameter ratio, cylinder support, head and gate, breaker plate, automatic temperature control, machine and motor base, machine guard, control cabinet and motor drives are included.

•

Cyclo-trell Multiple Tube Dust Collector. (Bulletin No. 100). Research-Cottrell, Inc., Bound Brook, N. J. 8½ x 11 in. 12 pp.

This illustrated bulletin explains the operation and construction of a multiple tube dust collector, called the Cyclo-trell, with the aid of numerous drawings, cut-away views, and collection efficiency and capacity nomographs. Tables give design data for the six available sizes of the Cyclo-trell, ranging from three to twenty tubes. A procedure for installing the dust collector using a step-by-step outline and an accompanying cut-away diagram is included.

•

Management Guide to Vacuum Forming. Vacuum Forming Corp., 76 Bales Ave., Port Washington, N. Y. 3¾ x 9 in. 12 pp.

A discussion of the principles, advantages and applications of vacuum forming is included in this booklet. An illustrated list of some industries which are applying vacuum and drape forming to their products is included. A check list of product improvements suggests some of the changes in manufacturing materials and methods which have been developed through the use of this process. General features of various pieces of equipment as manufactured by the company are also given.

•

The New Standard in Automatic Molding. (Bulletin No. A-456). Hull-Standard Corp., Abington, Penna. 8½ x 11 in. 4 pp.

Of special interest to the plastics industry, this brochure describes and illustrates the various features of Hull-Standard's new line of completely automatic compression molding presses. The units are available in 50, 75, 100, 150, 200 and 300 ton sizes. Included is a listing of such specifications as maximum press capacity, pump pressure, oil tank capacity, mold thickness allowable, platen and ejector, stroke, and press close and open speed.

•

Oilgear Fluid Power Constant Displacement Pumps. (Bulletin No. 46000). The Oilgear Co., 1587C W. Pierce St., Milwaukee 4, Wisc. 8½ x 11 in. 8 pp.

Twenty-one different sizes of the company's line of constant displacement radial piston pumps are described in this bulletin. Construction features of the pumps, accompanied by cut-a-way diagrams, help explain their operation and function. Specifications of the various pumps are given in tabular form and include pump size, drive speed, input hp and the capacity in cipm and gpm flow at the drive speeds indicated.

•

Belt Idler Specifications. Joy Manufacturing Co., 307 Oliver Bldg., Pittsburgh 22, Penna. 8½ x 11 in. 12 pp.

Included in this two-color booklet are design and application data for those who select, specify, purchase and use belt conveyors to handle bulk materials. Descriptions, dimensional drawings, specification tables and suggested applications for "Limberoller" idlers and various troughing, impact, training and return brackets to use with belt widths of 18 through 72 inches are given.

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MARKET REPORTS

TRENDS
NEWS
PRICES

Natural Rubber

Since our last report (August 31), the price of spot rubber on the New York Commodity Exchange has moved in a range of 164 points, high for the period being 33.25c reached on September 14, 17 and 18, and low being 31.61c reached on September 24, 25 and 26. The average price of spot rubber for the month of September was 32.64c based on 19 trading days. This compares with an average of 35.69c in the previous month.

The trade reports that although buyer's confidence has not been fully restored, there is a notable tendency to pay more attention to operations by Red China in the Singapore market. After all, Singapore has been inclined to lag for some little time. Now that China is credited with having bought about 6,500 tons of rubber from Malaya, much of which is said to be No. 1 R.S.S. and for relatively nearby shipment, less stress is being placed upon the comparatively large stocks in Malaya, current reports state.

Optimistic Detroit Reports

There is also a tendency to anticipate optimistic reports from Detroit, and this is serving to make for a somewhat more friendly sentiment to the natural rubber market.

However, it will take a resumption of active buying on the part of consumers on the continent to bring about a much improved feeling in the markets of Europe which, in turn, would have its influence in Singapore and in the United States market as well.

Ceylon has yet to ship 20,000 tons of sheet rubber owed to China under the rubber-rice pact. This includes the balance due from 1956 as well as the quantity by which the 1955 shipments fell short of the agreement. Up to August 31, 31,500 tons had been shipped under the 1956 agreement. A shipment of 800 tons left in the first week of September and a vessel has just loaded an additional 7,300 tons, trade sources report.

Production-Consumption Reports

The Rubber Manufacturers Association estimates that 323,838 long tons of dry natural rubber were imported into the United States in the first eight months of the current year and 51,892 tons of latex, for a total of 375,730 long tons. The RMA figures indicate that 377,455 long tons of natural rubber were consumed in the first eight months of this year, including 331,253 long tons of dry rubber and 46,202 long tons of latex.

World production of rubber exceeded consumption by 17,500 long tons in July, according to the International Rubber Study Group. Output amounted to 162,500 long tons while consumption totaled 145,000 long tons, including estimated imports into the U. S. S. R. of 9,650 tons and into China of 6,900 tons. This brought total production for the first seven months of this year to 1,015,000 tons. Consumption during the same period amounted to 1,092,500 long tons, including imports of 75,925 to the U. S. S. R. and 42,450 long tons into Red China.

NEW YORK, SEPTEMBER 30, 1956

Price Data

Closing Rubber Prices on New York Commodity Exchange

FROM SEPTEMBER 1 TO SEPTEMBER 30

Sept.	No. 1 R.S.S. Spot	No. 1 R.S.S. Sept.	No. 1 R.S.S. Dec.	Rex Sept.	Rex Nov.	Rex Sales
1	....	....	....	....	....	....
2	....	....	....	....	....	....
3	....	....	....	....	....	....
4	32.75	32.50	32.60	32.25	31.90	407
5	33.00	32.85	33.00	32.65	32.50	410
6	32.75	33.40	32.60	32.15	32.20	410
7	33.13	32.80	33.00	32.55	32.65	421
8	....	....	....	....	....	....
9	....	....	....	....	....	....
10	32.85	32.70	32.95	32.45	32.50	414
11	32.37	31.95	32.40	31.70	32.00	453
12	32.75	32.40	32.75	32.15	32.25	450
13	33.00	33.00	33.50	32.65	33.00	468
14	33.25	33.70	33.75	33.35	33.05	490
15	....	....	....	....	....	....
16	....	....	....	....	....	....
17	33.25	33.15	33.35	32.95	32.60	491
18	33.25	33.05	33.35	32.85	32.85	506
19	32.75	32.30	32.70	32.10	32.30	561
20	32.75	32.80	32.90	32.25	32.60	584
21	32.61	32.00	32.40	31.80	32.10	585
22	....	....	....	....	....	....
23	....	....	....	....	....	....
24	31.61	31.05	31.25	30.85	31.05	619
25	31.61	31.00	31.25	30.80	31.05	607
26	31.61	30.80	31.25	30.60	31.35	632
27	32.50	....	32.30	....	32.00	652
28	32.50	....	32.74	....	32.25	716
29	....	....	....	....	....	....
30	....	....	....	....	....	....

Outside Market

No. 1 Ribbed Smoked Sheets:	
Spot	.32¼
October	.32½
November	.32⅜
Thin Latex Crepe:	
Spot	.43
Thin Brown Crepe, No. 2	.27
Flat Bark Crepe	.20¾

London Market
(Standard Smoked Sheets)

Jan.-Mar.	31.75 - 31.89
Apr.-June	31.02 - 31.17

Singapore Market
(Standard Smoked Sheets)

Nov.	29.97 - 30.04

Middling Upland Quotations

	Aug. 31 Close	September 28 High	September 28 Low	September 28 Close
Oct.	33.74	34.00	33.95	34.00
Dec.	33.83	34.20	34.06	34.17
Mar.	33.72	34.38	34.15	34.30

Notes and Quotes

Synthetic rubber production in the United States can be stretched rapidly to cover any gap in the supply of natural rubber caused by difficulties at the Suez Canal, John L. Collyer, chairman of the B. F. Goodrich Co., predicted recently. "Contrary to widespread beliefs," Mr. Collyer said, "there would not be a shortage of rubber in the U. S. or the rest of the Free World if shipping through the Suez were interrupted." He noted that less than 30% of U. S. rubber supplies came through the canal.

Mr. Collyer, before sailing on the S.S. United States for Europe, stated that more than 60% of the new rubber now being used in the United States is synthetic rubber. He pointed out that last year, synthetic rubber accounted for 58.5% of all the new rubber used in the United States.

Synthetic Rubber

In view of the uneasiness over the Suez Canal dispute and the relatively higher prices for natural rubber, the question arises as to why there has not been a much greater demand for U. S. synthetic from abroad. Synthetic rubber is still more favorably priced than natural, and there is guaranteed delivery at any specific period.

Some advance the theory that many manufacturers abroad are still not familiar with the best means of utilizing synthetic rubber. Still others intimate that quantities of synthetic rubber are available overseas at prices well under offerings from first hands.

Talk is also heard that U. S. producers, in some cases, are shading prices to buyers abroad. One point is clear, however, and that is that inquiries for synthetic rubber here from interests abroad are now negligible. Some months ago such inquiries were quite numerous. There is a belief in some quarters that unless the export rate picks up the production rate in the United States will be slowed down. As the price of natural rubber recedes, it becomes more and more difficult to find new outlets for synthetic rubber abroad.

Legal Classification Cited

While synthetic rubber cannot be classified in the agricultural commodity list, trade spokesmen say, the fact remains that the export outlook for synthetic rubber could be brightened measurably if ways and means could be devised whereby synthetic rubber could be sold for export under ICA allocations or something comparable to Public Law 480. This would permit the recipient nation to pay in local currency. A development of this kind, it is believed, would do much to stimulate an increase in foreign interest for U. S. synthetic rubber.

Meanwhile, the first of Great Britain's new synthetic rubber plants has started its experimental runs and will be in full production by the end of this year, London advises. The new plant, owned by Imperial Chemical Industries at Wilton, has been designed to produce 10,000 tons of general purpose synthetic rubber a year. It is being constructed at a cost of about $12,000,000.

Another synthetic plant shortly to go into production is the Dunlop Rubber Co. experimental unit at Fort Dunlop. Experimental runs are expected to begiln shortly. This plant has a capacity of 2,000 tons annually and is scheduled for full operation by the end of the year. Monsanto Chemical's new plant at Newport, with an annual capacity of some 4,000 tons, is nearing completion.

U. K. Consumption Rising

Certainly United Kingdom consumption of synthetic rubber is rising rapidly. Last year the total rose to over 20,000 tons. This year, the government permitted imports of 70,000 tons and in the first six months the annual rate of consumption was 78,000 tons. In addition, the government has granted permission for 80,000 tons to be imported in 1957, though this has met with objections from Malayan natural rubber producers.

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(dry types—per pound carload unless otherwise specified)

Butadiene-Acrylonitrile Types

Butaprene NAA	.5400 [1]
Butaprene NF	.4900 [1]
Butaprene NL	.5000 [1]
Butaprene NXM	.5800 [1]
Chemigum N1	.6400 [2]
Chemigum N3	.5800 [2]
Chemigum N5	.5800 [2]
Chemigum N6	.5000 [2]
Chemigum N7	.5000 [2]
Hycar 1001	.5800 [2]
Hycar 1002	.5000 [2]
Hycar 1014	.6000 [2]
Hycar 1041	.5800 [2]
Hycar 1042	.5000 [2]
Hycar 1043	.5000 [2]
Hycar 1312	.6000 [2]
Hycar 1411	.6200 [2]
Hycar 1432	.5900 [2]
Hycar 1441	.6200 [2]
Paracril AJ	.4850 [2]
Paracril B	.5000 [2]
Paracril BJ	.5000 [2]
Paracril BLT	.5000 [2]
Paracril C	.5800 [2]
Paracril CV	.5900 [2]
Paracril D	.6500 [2]
Paracril 18-80	.6000 [2]
Polysar Krynac 800	.5000 [2]
Polysar Krynac 801	.5800 [2]
Polysar Krynac 802	.5000 [2]
Polysar Krynac 803	.5000 [2]

Butadiene-Styrene Types

Ameripol 1001	.2410 [2]
Ameripol 1002	.2435 [2]
Ameripol 1006	.2410 [2]
Ameripol 1500	.2410 [2]
Ameripol 1501	.2410 [2]
Ameripol 1502	.2410 [2]
Ameripol 1703	.2060 [2]
Ameripol 1705	.2035 [2]
Ameripol 1706	.2035 [2]
Ameripol 1707	.1910 [2]
Ameripol 1709	.1885 [2]
Ameripol 1710	.1885 [2]
Ameripol 1711	.1885 [2]
Ameripol 1712	.1885 [2]
ASRC 1000	.2410 [2]
ASRC 1001	.2410 [2]
ASRC 1004	.2410 [2]
ASRC 1006	.2410 [2]
ASRC 1500	.2410 [2]
ASRC 1502	.2410 [2]
ASRC 1703	.2060 [2]
ASRC 1708	.1910 [2]
Baytown 1600	.1850 [2]
Baytown 1601	.1850 [2]
Baytown 1602	.1850 [2]
Baytown 1801	.1700 [2]
Copo 1500	.2410 [2]
Copo 1502	.2410 [2]
Copo 1712	.1885 [2]
FR-S 1000	.2300 [2]
FR-S 1001	.2300 [2]
FR-S 1004	.2300 [2]
FR-S 1006	.2300 [2]
FR-S 1009	.2600 [2]

Butadiene-Styrene (Cont'd)

FR-S 1010	.2650 [2]
FR-S 1012	.2700 [2]
FR-S 1013	.2600 [2]
FR-S 1015	.2800 [2]
FR-S 1500	.2300 [2]
FR-S 1502	.2300 [2]
FR-S 1703	.1950 [2]
FR-S 1705	.1925 [2]
FR-S 1710	.1775 [2]
Naugapol 1016	.2650 [2]
Naugapol 1018	.2700 [2]
Naugapol 1019	.2650 [2]
Naugapol 1021	.3000 [2]
Naugapol 1022	.2800 [2]
Naugapol 1023	.2850 [2]
Naugapol 1503	.2625 [2]
Naugapol 1504	.2950 [2]
Philprene 1000	.2410 [1]
Philprene 1001	.2410 [1]
Philprene 1006	.2410 [1]
Philprene 1009	.2550 [1]
Philprene 1018	.2700 [1]
Philprene 1019	.2650 [1]
Philprene 1500	.2410 [1]
Philprene 1502	.2410 [1]
Philprene 1503	.2625 [1]
Philprene 1601	.1910 [1]
Philprene 1605	.1870 [1]
Philprene 1703	.2060 [1]
Philprene 1706	.2030 [1]
Philprene 1708	.1910 [1]
Philprene 1712	.1880 [1]
Philprene 1803	.1720 [1]
Philprene 1806	.1760 [1]
Plioflex 1006	.2410 [2]
Plioflex 1502	.2410 [2]
Plioflex 1703	.2060 [2]
Plioflex 1710	.1885 [2]
Plioflex 1773	.2060 [2]
Plioflex 1778	.1910 [2]
Polysar Kryflex 200	.2410 [2]
Polysar Krylene	.2410 [2]
Polysar Krylene NS	.2410 [2]
Polysar Krynol 651	.1885 [2]
Polysar Krynol 652	.1910 [2]
Polysar S	.2410 [2]
Polysar S-50	.2410 [2]
Polysar S-X 371	.2550 [2]
Polysar SS-250	.3000 [2]
S-1000	.2300 [2]
S-1001	.2300 [2]
S-1002	.2325 [2]
S-1006	.2300 [2]
S-1011	.2325 [2]
S-1013	.2300 [2]
S-1100	.1850 [2]
S-1500	.2300 [2]
S-1501	.2300 [2]
S-1502	.2300 [2]
S-1600	.1850 [2]
S-1601	.1850 [2]
S-1602	.1850 [2]
S-1703	.1950 [2]
S-1705	.1925 [2]
S-1706	.1925 [2]
S-1707	.1800 [2]
S-1709	.1775 [2]
S-1712	.1775 [2]
S-1801	.1700 [2]

Butadiene-Styrene (Cont'd)

S-2000	.2275 [2]
S-2101	.2250 [2]
Synpol 1000	.2410 [2]
Synpol 1001	.2410 [2]
Synpol 1002	.2435 [2]
Synpol 1006	.2410 [2]
Synpol 1007	.2425 [2]
Synpol 1009	.2475 [2]
Synpol 1012	.2425 [2]
Synpol 1013	.2500 [2]
Synpol 1061	.2410 [2]
Synpol 1500	.2410 [2]
Synpol 1502	.2410 [2]
Synpol 1551	.2410 [2]
Synpol 1703	.2060 [2]
Synpol 1707	.1910 [2]
Synpol 1708	.1950 [2]
Synpol 1711	.1900 [2]

Butyl Rubbers

Enjay Butyl 035	.2300 [2]
Enjay Butyl 150	.2300 [2]
Enjay Butyl 165 NS	.2400 [2]
Enjay Butyl 215	.2300 [2]
Enjay Butyl 217	.2300 [2]
Enjay Butyl 218	.2300 [2]
Enjay Butyl 268 NS	.2400 [2]
Enjay Butyl 325	.2300 [2]
Enjay Butyl 365 NS	.2400 [2]
Polysar Butyl 100	.2450 [2]
Polysar Butyl 101	.2775 [2]
Polysar Butyl 200	.2450 [2]
Polysar Butyl 300	.2450 [2]
Polysar Butyl 301	.2550 [2]
Polysar Butyl 400	.2450 [2]

Neoprene

	(prices l.c.l.)
Neoprene Types AC and CG	.5500 [2]
Neoprene Type GN	.4100 [2]
Neoprene Type GN-A	.4100 [2]
Neoprene Type GRT	.4200 [2]
Neoprene Type KNR	.7500 [2]
Neoprene Type S	.4200 [2]
Neoprene Type W	.3900 [2]
Neoprene Type WHV	.3900 [2]
Neoprene Type WRT	.4500 [2]
Neoprene Type WX	.4100 [2]

Silicone Rubbers*

	(prices l.c.l.)
GE (compounded)	2.50 [2]
GE Silicone Gum (not compounded)	4.00 [2]
Silastic (compounded)	1.90 [2]
Union Carbide (gums)	4.00 [2]
Union Carbide (compounds)	2.50 [2]

Polysulfide Rubbers

	(prices l.c.l.)
Thiokol Type A	.4700 [2]
Thiokol Type FA	.6400 [2]
Thiokol PR-1	.9500 [2]
Thiokol Type ST	1.00 [2]

(latices—all prices per pound dry weight)

Butadiene-Acrylonitrile Types

Butaprene N-300	.4600 [1]
Butaprene N-400	.5400 [1]
Butaprene N-401	.5400 [1]
Chemigum 200	.4900 [2]
Chemigum 235	.5400 [2]
Chemigum 236	.5400 [2]
Chemigum 245	.4600 [2]
Chemigum 246	.4600 [2]
Hycar 1512	.4600 [2]
Hycar 1551	.5400 [2]
Hycar 1552	.4600 [2]
Hycar 1561	.5400 [2]
Hycar 1562	.4600 [2]
Hycar 1571	.5900 [2]
Hycar 1572	.5100 [2]
Hycar 1577	.4600 [2]

Butadiene-Styrene Types

Copo 2101	.2800 [2]
Copo 2102	.3100 [2]

Butadiene-Styrene (Cont'd)

Copo 2105	.3100 [2]
Copo X-765	.2900 [2]
FR-S 2000	.2600 [2]
FR-S 2001	.2600 [2]
FR-S 2002	.2850 [2]
FR-S 2003	.2950 [2]
FR-S 2004	.2950 [2]
FR-S 2006	.2600 [2]
FR-S 2105	.3100 [2]
Pliolite 2101	.3000 [2]
Pliolite 2104	.3200 [2]
Pliolite 2105	.3200 [2]
Pliolite X-765	.3000 [2]
Naugatex 2000	.2630 [2]
Naugatex 2001	.2630 [2]
Naugatex 2002	.2880 [2]
Naugatex 2005	.3000 [2]
Naugatex 2006	.2630 [2]
Naugatex 2101	.2850 [2]

Butadiene-Styrene (Cont'd)

Naugatex 2105	.3120 [2]
Naugatex X-767	.3230 [2]
S 2004	.2600 [2]

Neoprene

Neoprene Latex 60	.4000 [2]
Neoprene Latex 571	.3700 [2]
Neoprene Latex 572	.3900 [2]
Neoprene Latex 601-A	.4000 [2]
Neoprene Latex 735	.3800 [2]
Neoprene Latex 736	.3800 [2]
Neoprene Latex 842-A	.3700 [2]
Neoprene Latex 950	.4700 [2]

Polysulfide Rubbers

Thiokol Type MX	.7000 [2]
Thiokol Type WD-2	.9200 [2]
Thiokol Type WD-6	.7000 [2]

Notes: (1) Freight allowed. (2) Freight extra. (3) Freight prepaid. * Covers a wide range of compounds. Readers are urged to check specific prices with producers.

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MARKETS

(continued)

Reclaimed Rubber

Production of reclaimed ruber in the first seven months of this year has been set at 175,645 long tons by the U. S. Department of Commerce. In the first seven months of the preceding year, 189,192 long tons were produced. In the 1956 period, about 135 long tons were imported, while in the comparable period of the preceding year, 375 long tons were imported.

The Commerce Department estimates that 163,704 long tons of reclaim were consumed in the first seven months of the current year, while in the first seven months of 1955, 184,310 long tons were consumed. During the 1956 period, 7,400 long tons were exported, and 6,486 tons were exported in the 1955 period.

As of July 31, 1956, there were 35,431 long tons of reclaimed rubber on hand. On July 31, 1955, there were 29,939 long tons on hand. The figures to date would indicate that total 1956 figures will run only slightly behind comparable 1955 totals.

(Prices for All Areas Except Calif.)

	per lb.
Premium Grade Whole Tire	.11
First Line Whole Tire	.10½
Second Line Whole Tire	.10
Third Line Whole Tire	.09½
Fourth Line Whole Tire	.09¼
Black Carcass	.14¾
No. 1 Light Colored Carcass	.20¾
No. 1 Peel	.11
Butyl Tube Reclaim	.14
Natural Rubber Black Tube	.15
Natural Rubber Red Tube	.21
Natural Rubber Gray Tube	.21

Scrap Rubber

There was little change in the scrap rubber market during the past period. Activity consisted mainly in the filling of mixed auto tire orders. No immediate pick-up in demand is anticipated. It is noted, however, that consumption of scrap normally does increase during the winter months.

The commerce Department reports that 2,132,400 pounds of scrap rubber valued at $109,638, were imported into the U. S. in May, against 1,860,359, worth $89,143, in April. For the first five months of this year, scrap rubber imports totaled 11,614,438 pounds valued at $609,023.

Canada was the chief shipper of scrap rubber to the U. S. in May, with 1,179,962 pounds, or more than half the month's total. Following in order were the United Kingdom, West Germany, France and Ceylon.

(Prices Delivered Akron)

Mixed tires	ton	15.00
Light colored carcass	lb.	.05½
No. 1 peelings	ton	45.00
No. 2 peelings	ton	30.00
No. 3 peelings	ton	21.00
Buffings	ton	16.00
Truck and Bus S.A.G.	ton	20.00
Passenger S.A.G.	ton	17.50
Natural Rubber Red Tubes	lb.	.07½
Natural Rubber Black Tubes	lb.	.06¼
Butyl Rubber Tubes	lb.	.03¾

Tire Fabrics

A firmer tone has become evident in the wide industrial fabrics market during the past few weeks as more coaters and automobile manufacturers showed interest in covering their fall requirements. A considerable part of current trading is for October delivery, a market check indicates, but there has been some buying taking place for delivery through the fourth quarter. While this is still not general, it is considered significant and indicative of a better undertone.

Increases Yarn Types

Allied Chemical & Dye Corp. has increased to thirteen the number of "Caprolan" nylon heavy yarns now in commercial production. Caprolan yarns were introduced to the trade last year and established on a commercial basis early in 1956.

Caprolan heavy yarns are a new class of high tenacity nylon yarns which are easy to dye and completely versatile in their applications. In addition, the yarns are finding acceptance in industrial fabrics and mechanical goods where high impact strength and toughness are essential. Caprolan yarns have found acceptance in webbings, conveyor belt fabrics, nettings, tapes and similar uses.

Dow Chemical has introduced a new man-made fiber which will be marketed under the trade name of "Zefran." Designated as a "nitrile alloy," the new fiber was perfected after five years of research and will be ready for full-scale commercial production in about eighteen months. Some of the end uses indicated for Zefran were said to include drapery and upholstery fabrics, industrial goods, work clothes, suitings, etc.

DuPont is planning a 25% increase in Dacron polyester fiber staple and tow capacity at its Kinston, N. C., plant. Construction has already begun, and the initial operation of the new facilities is expected in the second quarter of 1957.

Rayon Yarn Shipments

The Textile Economics Bureau reports that rayon high tenacity yarn shipments during August were 28,500,000 pounds, 1½% above July. Regular plus intermediate tenacity rayon yarn shipments in the latest month were 13,900,000 pounds, 15% over the July figure. August acetate filament yarn shipments amounted to 14,600,000 pounds, an increase of 13% over July. August shipments of rayon staple plus tow totaled 27,200,000 pounds, a figure 20½% larger than July.

(Prices f.o.b. Shipping Point)

Rayon Tire Cord

1100	lb.	.76
1650	lb.	.70
2200	lb.	.70½

Nylon Tire Cord

210	lb.	1.95
840	lb.	1.80

Rayon Graded Fabric

1100	lb.	.72
1650	lb.	.66½
2200	lb.	.66

Cotton Chafers

14.4 oz. (per square yard)	lb.	.73
9.25 oz. (per square yard)	lb.	.68
11.65 oz. (per square yard)	lb.	.64
8.9 oz. (per square yard)	lb.	.70

Liquid Latex

Natural: The Commerce Department reports that 43,531 long tons of hevea latex were imported into the United States in the first seven months of the current year. This is about 3,000 long tons less than were imported into the U. S. in the first seven months of the preceding year.

In the first seven months of 1956, the Commerce Department reports, 40,228 long tons of natural rubber latex were consumed. This is 9,000 long tons less than were consumed in the first seven months of 1955.

As of July 31, 1956, there were 19,560 long tons of natural rubber latex on hand, almost 8,000 long tons more than were on hand on July 31, 1955. Current prices for hevea latex are at the 38c per pound level in tank car lots at East Coast ports.

Synthetic: S-type latex production in the first seven months of this year at 39,424 long tons, just about matches production in the comparable period of 1955. The Commerce Department estimates that 35,194 long tons of S-type latex were consumed in the first seven months of this year, compared with 33,931 long tons in the first seven months of 1955.

Neoprene latex production and consumption in the first seven months of this year have been keeping pace with the comparable period of 1955. In the first seven months of this year, 5,819 long tons of neoprene latex were produced and 5,002 long tons consumed. In the first seven months of 1955, 5,669 long tons were produced and 4,951 consumed.

In N-type latices, 5,658 long tons were produced in the first seven months of 1956 and 4,519 were consumed, against 6,159 and 3,649, respectively, in the first seven months of 1955.

Cotton

The price of middling uplands on the New York Cotton Exchange has moved in a range of only 30 points since our last report (August 31), high for the period being 34.55c reached on September 20 and again on September 25 and 26, and low being 34.25c reached on September 12. The average price of middling uplands for the month of September was 34.25c based on 19 trading days. This compares with an average of 34.31c in August.

The tight credit situation will be a limiting factor in any expanding operations of cotton exporters or cotton mills, some government officials believe. Cotton exporters buying raw cotton under the government's cut price program have to expand their credit operations. Large shippers are moving into lines of credit with banks they never used before and smaller shippers are having trouble obtaining the necessary credit.

The U. S. Department of Agriculture has issued four authorizations to Indonesia to purchase up to $13,500,000 worth of upland cotton from the U. S. Each of the authorizations provides that Indonesia will exchange the cotton with a third country which will then process it into yarns and textiles needed in Indonesia.

Prices on Indian varieties of raw cotton have started to decline as a result of the recent Indo-U. S. agreement for surplus agricultural commodities. The consensus among traders at Bombay is that indigenous long staple cotton is likely to decline, in view of the Indian government's recent decision to impose higher excise taxes on fine and superfine fabrics.

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MARKET PRICES

CHEMICALS & COMPOUNDING INGREDIENTS

OCTOBER 1, 1956

Prices are, in general, f.o.b. works and cover the domestic markets only. Export prices, as a rule, are usually slightly higher, due to packing regulations, special handling, etc.

Abbreviations: bbls., barrels; c.l., carload; cyl., cylinder; dlvd., delivered; dms., drums; eqld., equalized; l.c.l., less than carload; M.B. masterbatch; min., minimum; ref., refined; sap., saponified; sp., special; syn., synthetic; t.c., tank cars.

***Trademark. †For Export Only.**

The arrangement of this section closely follows the Chemical Section of the 1955-56 RUBBER RED BOOK. Readers are referred to that edition for the correct classification of any material or brand name. Suppliers of every material are contacted for price information. However, only those materials are listed for which quotations have been furnished within the past six months. The quotations are not guaranteed and prospective purchasers should contact suppliers for information. Suppliers are requested to send current price information to the Market Editor, RUBBER AGE.

ACCELERATORS

A-1 (Thiocarbanilide)*	lb.	.72	.79
A-32*	lb.	.66	.80
A-100*	lb.	.52	.66
Accelerator No. 8*	lb.	—	1.10
Accelerator 49*	lb.	.57	.58
Accelerator 89*	lb.	—	1.20
Accelerator 108*	lb.	—	.90
Accelerator—552*	lb.	—	2.25
Accelerator—808*	lb.	.66	.68
Accelerator—833*	lb.	1.17	1.19
Accelerator B*	lb.	—	.89
Altax*	lb.	.52	.54
Ancap*(†)	lb.	.38	.40
Ancatax*(†)	lb.	.48	.50
Ancazate BU (ET & ME)*(†)	lb.	—	1.07
Ancazide ET*(†)	lb.	—	1.07
ME*(†)	lb.	—	1.14
Arazate*	lb.	—	2.25
Arquad 12*	lb.	.55	.61
Beutene*	lb.	.66	.68
Bismate, Rodform*	lb.	—	3.00
Butazate*	lb.	—	1.04
Butyl Eight*	lb.	1.10	1.35
Captax*	lb.	.42	.44
C-P-B*	lb.	—	1.95
Cumate, Rodform*	lb.	—	1.45
Diorthotolylguanidine	lb.	.62	.63
Diphenylguanidine	lb.	.52	.53
El-Sixty*	lb.	.58	.65
Ethazate*	lb.	—	1.04
50D*	lb.	—	.85
Ethyl Thurad*	lb.	—	1.04
Ethyl Tuex*	lb.	—	1.04
Ethylac*	lb.	.93	.95
Guantal*	lb.	.58	.65
Harvex*	lb.	.70	.76
Hepteen Base*	lb.	—	1.85
Kure-Blend MT*	lb.	—	.70
Ledate, Rodform*	lb.	—	1.04
MBT-XXX*	lb.	.53	.55
Merac*	lb.	.75	1.05
Mercaptobenzothiazole	lb.	.42	.44
Mercaptobenzothiazyl Disulfide	lb.	.52	.54
Mertax*	lb.	.51	.58
Methazate*	lb.	—	1.04
Monex*	lb.	—	1.14
Mono Thiurad*	lb.	—	1.14
Morfex*	lb.	.65	.67
2-MT	lb.	—	1.00
NA-22* (for neoprene)	lb.	—	1.00
NOBS No. 1*	lb.	.74	.76
Special*	lb.	.79	.81
O.X.A.F.	lb.	.53	.55
Pentex*	lb.	—	1.04
Flour*	lb.	—	.26
Permalux (Neoprene)*	lb.	—	2.17
Phenex*	lb.	.52	.57
Polyac*	lb.	—	1.85
R-2 Crystals*	lb.	—	4.35
Rotax*	lb.	.53	.55
RZ-50-A*	lb.	—	1.00
B*	lb.	—	1.00
SA 52*	lb.	—	1.14
SA 57*	lb.	—	1.04
SA 62*	lb.	—	1.04
SA 66*	lb.	—	4.25
SA 67*	lb.	—	1.04
SA 77*	lb.	—	1.04
Santocure*	lb.	.72	.79
NS*	lb.	.78	.85
Selenac* (Ethyl, Methyl)	lb.	—	4.25
Setsit-5*	lb.	.75	1.05
9*	lb.	.85	1.15
SPDX-GH*	lb.	.69	.71
GL*	lb.	1.20	1.30
Tellurac*	lb.	—	1.45
Tepidone*	lb.	.45	.48
Tetrone A*	lb.	—	1.91
Thiofide*	lb.	.50	.57
S*	lb.	.52	.59
Thionex*	lb.	—	1.14
Thiotax*	lb.	.40	.47
Thiurad*	lb.	—	1.14
Thiuram E*	lb.	—	1.04
M*	lb.	—	1.14
Trimene*	lb.	.56	.58
Base*	lb.	1.03	1.06
Triphenyl Guanidine	lb.	—	.90
Tuads* (Ethyl)	lb.	—	1.04
Tuads* (Methyl)	lb.	—	1.14
Tuex*	lb.	—	1.14
Ultex*	lb.	1.00	1.10
Unads*	lb.	—	1.14
ZB*	lb.	—	.85
ZE*	lb.	—	.85
ZM*	lb.	—	.85
Z-B-X*	lb.	—	2.45
Vulcacure NB*	lb.	—	.45
Zenite*	lb.	.52	.54
A*	lb.	.62	.64
Zenite Special*	lb.	.53	.55
Zetax* (uncoated)	lb.	.53	.55
Zimate* (Butyl)	lb.	—	1.04
Zimate* (Ethyl)	lb.	—	1.04
Zimate* (Methyl)	lb.	—	1.04

ACTIVATORS

Blue Lead Sublimed (dlvd.)	lb.	.17¼	.18¼
Cottonseed Fatty Acids			
Wochem 210*	lb.	—	.15¼
211*	lb.	—	.15¾
Fish Oil, Hydrogenated, Fatty Acid			
DAR-S* (dlvd.)	lb.	.12½	.14½
DAR-HY* (dlvd.)	lb.	.14¼	.16¼
Hydrofol Acids* (dlvd.)	lb.	.15¼	.17¼
Hyfac 430* (dlvd.)	lb.	.16¾	.18¾
Neo-Fat H.F.O.* (dlvd.)	lb.	.14½	.15¾
Neutrex* (dlvd.)	lb.	.15	.17
Stearex Beads* (dlvd.)	lb.	.09¾	.10¼
Stearite*	lb.	.12	.14
Talene* (dlvd.)	lb.	.15¼	.17¼
Lime, Hydrated			
Arrowhead*	ton	—	21.00
Marblehead*	ton	—	17.75
Sierra*	ton	—	22.50
Litharge			
Eagle-Picher* (c.l.)	lb.	.18	—
SB* (dlvd.)	lb.	—	.18½
Magnesium Oxide, Heavy			
General Magnesite 500*	lb.	.05½	.06
600*	lb.	.06½	.07
Kaiser 325*	lb.	.057	.073
Michigan No. 15*	lb.	.05½	.06½
Magnesium Oxide, Light			
Carey Mag*	lb.	.25¼	.26
General Magnesite* (neoprene grade)	lb.	.30	.32
General Magnesite No. 101*	lb.	.25¼	.26
Genmeg MLW*	lb.	.25¼	.26
K & M* (neoprene grade)	lb.	.29¼	.30
Light Calcined Magnesia No. X-01*	lb.	.25¼	.26

ACTIVATORS (Cont'd)

Magnesium Oxide, Light (cont'd)			
Maglite D*	lb.	.25¼	.26
L and M*	lb.	.29¼	.30
Michigan No. 30*	lb.	.25½	.26
Neomag Powder*	lb.	.29¼	.30
Pellets*	lb.	.31¼	.32
Michigan No. 40*	lb.	.29¼	.30
Oleic Acid			
Emersol 210* (dlvd.)	lb.	.18½	.20½
Groco Red Oil*	lb.	.18½	.20½
Neo-Fat 92-04*	lb.	.20½	.22½
94-04*	lb.	.18½	.20½
Wochem 310, 311	lb.	—	.18½
Palm Fatty Acids			
Groco 45*	lb.	.14¾	.16¼
Neo-Fat*	lb.	.15¾	.17¾
Wochem 280*	lb.	—	.14¾
281*	lb.	—	.15¼
Potassium Oleate (dms.)	lb.	.30	.73
Red Lead			
Eagle-Picher* (c.l.)	lb.	.19	—
No. 2 RM* (dlvd.)	lb.	—	.18½
Sodium Laurate, 75%	lb.	.64	.89
Sodium Oleate, 75%	lb.	.54	.79
Paste (dms.)	lb.	.39	.64
Sodium Stearate, 75%	lb.	.54	.89
Stearic Acid, Single Pressed			
Emersol 110* (dlvd.)	lb.	.14¾	.16¾
Groco 53*	lb.	.14¾	.16¾
Neo-Fat 18-53*	lb.	.14¾	.16¾
Standard Pearlstearic* (dlvd.)	lb.	.14½	.16¼
Stearex B* (dlvd.)	lb.	.15½	.16¾
Wochem 730*	lb.	—	.11¼
Stearic Acid, Double Pressed			
Choice Pearlstearic* (dlvd.)	lb.	.15¼	.17¼
Emersol 120* (dlvd.)	lb.	.15¼	.17¼
Groco 54*	lb.	.15¼	.17¼
Hydrofol Acid 51RG	lb.	.11¾	.13¼
Neo-Fat 18-54*	lb.	.15¼	.17¼
Wochem 731*	lb.	—	.14¼
Stearic Acid, Other			
Extra Pearlstearic* (dlvd.)	lb.	.17½	.19½
Groco*	lb.	.12	.14
Neo-Fat 18*	lb.	.18½	.20½
18-58*	lb.	.14¼	.16¼
18-61*	lb.	.16¼	.18¼
Stearite*	lb.	.11¼	.13¼
Wochem 720*	lb.	—	.11½
721*	lb.	—	.11½
732*	lb.	—	.15¼
White Lead Basic Carbonate	lb.	.19	.20
White Lead Basic Sulfate	lb.	.17¼	.18¼
Zinc Laurate			
Laurex*	lb.	.33	.34
Zinc Stearate	lb.	.39	.44
Aquazinc K.C.*	lb.	.30	.55
Crown Brand*	lb.	.39	.44

Unclassified Activators

Actifat* (dms.)	lb.	—	.18
Aktone*	lb.	.21¼	.23¼
Barak*	lb.	—	.62
Curade*	lb.	.57	.59
Dibenzo G-M-F	lb.	—	2.60
D-B-A*	lb.	—	1.95
G-M-F*	lb.	—	2.60
Dibutylamine (dlvd.)	lb.	.55	.56
MODX*	lb.	.32½	.34½
Neo Fat 42-07*	lb.	.10¼	12¼
Ridacto* (dms.)	lb.	.25	.26
Snodotte* (dlvd.)	lb.	.19	.21
Vulklor*	lb.	.88	.98

ANTI-COAGULANTS

Aqua Ammonia* (dms.)	lb.	.031	.035
M.B.M.C.* (l.c.l.)	lb.	.54	.76

ANTI-FOAMING AGENTS

Aero Anti Foam H*	lb	—	.20
Regular*	lb.	—	.12
Anhydrol 6991*	lb.	.51	.56
D.C. Antifoam A*	lb.	5.45	6.65
Antifoam A Emulsion*	lb.	2.05	4.00
Antifoam AF Emulsion*	lb.	2.05	2.85
Defoama W-1701*	lb.	—	.12½
Defoamer A-25*	lb.	—	3.00
Defoamer 630*	lb.	—	.14
Deltyl Prime	lb.	.70	.80

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Continental F — (HPC) — Witco No. 6
Continental R-40 — (CC) — Conducting

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Continex HMF — High Modulus
Continex HAF — High Abrasion
Continex FEF — Fast Extruding
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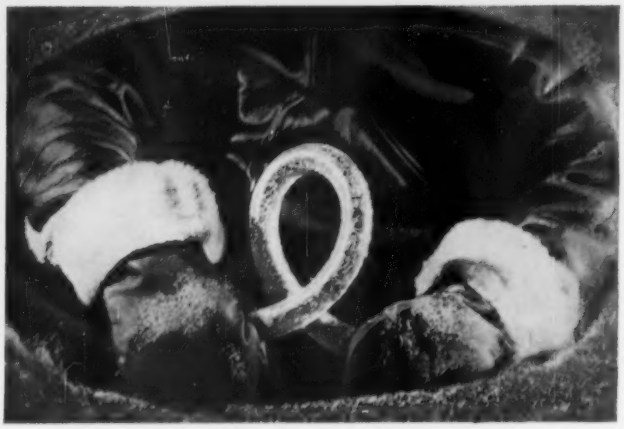

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Versatile "Thiokol" Synthetic Rubbers Have Wide Range of Applications

TOUGH, SYNTHETIC RUBBERS BY "THIOKOL" SERVE INDUSTRY IN MANY WAYS

- Paint Spray, Gasoline and Aromatic Fuel Hose
- Coated Paper Gaskets
- Printing and Coating Rollers
- Permanent Putties
- Molded Diaphragms and Gaskets

"Thiokol" Synthetic Rubbers provide:

- resistance to oils and solvents
- low temperature flexibility
- resistance to sunlight, ozone and aging
- impermeability to gases, moisture and liquids
- adhesion as putties to glass, metals, wood and plastics

Solvent-resistant hose. Hose made from "Thiokol" synthetic rubber is used successfully with the most deteriorating organic solvents. It displays outstanding resistance to paints and paint thinners, lacquers, aliphatic and aromatic liquids.

Coated Paper Gaskets. Inexpensive paper gaskets are made tough and oil-resistant with uncured "Thiokol" synthetic rubber. Coating is accomplished quickly and easily by rolling, spreading or dipping.

Printing and Coating Rollers. Outstanding resistance to swelling in aliphatic and aromatic solvents makes "Thiokol" synthetic rubber ideal for fabrication of lacquer, paint and inking rollers.

Permanent Putties. Versatile putties made from "Thiokol" Synthetic Rubbers have found wide acceptance in the building, marine and maintenance fields. They resist major causes of deterioration, including solvents, chemicals, sunlight, aging and weathering.

Molded Diaphragms and Gaskets. Washers, gaskets and diaphragms made of "Thiokol" synthetic rubber give the ultimate in oil and solvent resistance . . . are unaffected by aging and stay flexible over a wide temperature range.

For more technical information about "Thiokol" Synthetic Rubbers, write: THIOKOL CHEMICAL CORPORATION, 784 NORTH CLINTON AVE., TRENTON 7, N. J. In Canada: Naugatuck Chemicals Division, Dominion Rubber Company, Elmira, Ontario.

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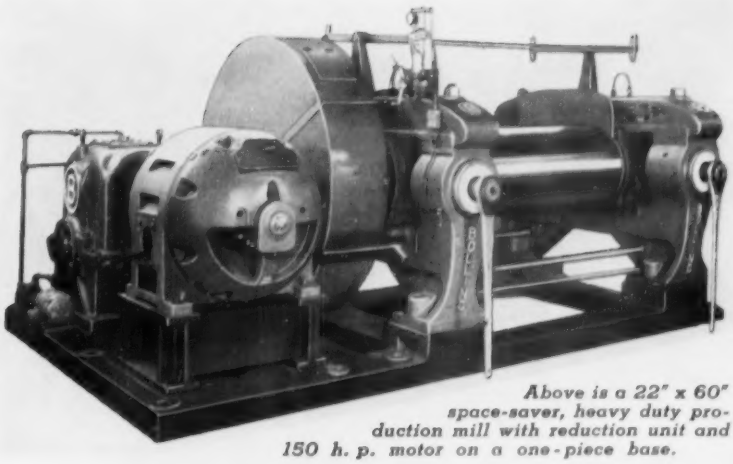

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ANTI-FOAMING AGENTS (Cont'd)

G-E Antifoam SS-24*	lb.	5.30	-	6.65
SS-66*	lb.	5.30	-	6.65
60 Emulsion*	lb.	2.05	-	3.75
Igepol CO-210	lb.	——	-	.36
Kessco X-3* (dms.)	lb.	——	-	.35
X-180*	lb.	——	-	.29½
X-181*	lb.	——	-	.38½
Nopco 1407*	lb.	.19½	-	.20½
1497-V*	lb.	.13¾	-	.14¼
1907-B*	lb.	.18¼	-	.19¼
JMK*	lb.	.48	-	.49
JMU*	lb.	.22½	-	.23½
JMY*	lb.	.19¾	-	.20¼
Pluronic L61*	lb.	.33½	-	.39
RS-968*	lb.	.38	-	.38½
Terpinol Prime No. 1	lb.	.35	-	.50
Tributyl Phosphate (dms.)	lb.	.52½	-	.53½

ANTIOXIDANTS

Agehost 1293-22A*	lb.	1.90	-	2.00
AgeRite Alba*	lb.	2.35	-	2.45
Gel*	lb.	.67	-	.69
Hipar*	lb.	1.00	-	1.02
H.P.*	lb.	.76	-	.78
Powder*	lb.	.55	-	.57
Resin*	lb.	.82	-	.84
Resin D*	lb.	.55	-	.57
Spar*	lb.	.55	-	.57
Stalite*	lb.	.55	-	.57
Stalite S*	lb.	.55	-	.57
Superlite*	lb.	.55	-	.57
White*	lb.	1.45	-	1.55
Akroflex C*	lb.	.81	-	.83
CD*	lb.	.76	-	.78
Aminox*	lb.	.55	-	.57
Antioxidant 425*	lb.	2.47	-	2.50
Antioxidant 2246*	lb.	1.50	-	1.53
Antox*	lb.	.55	-	.57
Aranox*	lb.	——	-	3.25
Benzoquinone	lb.	1.50	-	1.75
Betanox Special*	lb.	.85	-	.87
B.L.E.*	lb.	.55	-	.57
B.X.A.*	lb.	.55	-	.57
Deenax*	lb.	.95	-	1.05
Di-tert-Butyl-para-Cresol	lb.	.86	-	1.16
Eugenol C.95%*	lb.	2.30	-	2.50
Flectol H*	lb.	.55	-	.62
Flexamine*	lb.	.76	-	.78
Ionol* (dms.)	lb.	.91	-	.95
Neozone A*	lb.	.59	-	.61
C*	lb.	——	-	.83
D*	lb.	.55	-	.57
Nevastain A*	lb.	.51	-	.61
B*	lb.	.51	-	.70
Nullapon BF-12*	lb.	——	-	.21½
BF-13*	lb.	——	-	.25½
BF-78*	lb.	——	-	.55
BF-Acid*	lb.	——	-	.85
Octamine*	lb.	.55	-	.57
Oxidex*	lb.	——	-	3.60
PDA-10*	lb.	.46	-	.48
Permalux*	lb.	——	-	2.17
Polygard*	lb.	.55	-	.57
Santoflex AW*	lb.	.78	-	.85
DD*	lb.	.55	-	.62
75*	lb.	.97	-	1.04
Santovar-A*	lb.	1.50	-	1.57
Santowhite Crystals*	lb.	1.55	-	1.62
Santowhite L*	lb.	.55	-	.62
MK*	lb.	1.25	-	1.32
Powder*	lb.	1.55	-	1.62
Sequestrene AA*	lb.	.76	-	.85
NA2*	lb.	.62	-	.70
NA3*	lb.	.61	-	.69
Stabilite*	lb.	.55	-	.57
Alba*	lb.	.72	-	.77
FLX*	lb.	——	-	.65
L*	lb.	.60	-	.62
White*	lb.	.52	-	.54
White Powder*	lb.	.41	-	.43
Stabilizer No. 1*	lb.	1.55	-	1.80
Stabilizer No. 9-A*	lb.	.80	-	1.05
Styphen 1*	lb.	.51	-	.55
Sunolite*	lb.	.16	-	.22
Tannic Acid, Tech.	lb.	.46	-	.48
Thermoflex A*	lb.	1.00	-	1.02
V-G-B*	lb.	.75	-	.77
Wing-Stay S*	lb.	.53	-	.57

ANTI-SCORCHING AGENTS

Armeen HT*	lb.	.34	-	.40
Good-rite Vultrol*	lb.	.62	-	.64
Harcopol 1183*	lb.	.70	-	.74
Retarder PD*	lb.	.37	-	.39
W*	lb.	——	-	.42
Sodium Acetate 60-62% Crystals	lb.	.08	-	.08½

ANTISEPTICS AND GERMICIDES

A.P.C. 6901*	lb.	.32	-	.38
Arquad S*	lb.	.38	-	.44
Formaldehyde (dms.)	lb.	.06	-	.076
G-4* (bbls.)	lb.	1.09	-	1.29
G-11*	lb.	1.98	-	2.08
Halane*	lb.	.40	-	.47
Ortho Cresol (26°—27°)	lb.	.14	-	.16¼
Preventol GD	lb.	——	-	1.09
Retarder D*	lb.	.42	-	.50
Vancide	lb.	——	-	.80

ANTI-WEBBING AGENTS (for Latex)

DC 7 Compound*	lb.	5.13	-	6.50
Webmix 34-L*	lb.	1.25	-	1.75
69-C*	lb.	1.50	-	2.25

AROMATICS (DEODORANTS)

Airkem 115*	gal.	——	-	6.50
122*	gal.	——	-	6.50
186*	gal.	——	-	6.50
Alamask AA*	lb.	——	-	3.00
AF*	lb.	——	-	2.50
AO*	lb.	——	-	1.50
AR*	lb.	——	-	.50
BG*	lb.	——	-	1.15
BGM*	lb.	——	-	.60
CY*	lb.	——	-	2.40
DJ*	lb.	——	-	3.35
DL*	lb.	——	-	1.95
H*	lb.	——	-	5.50
LD*	lb.	——	-	.75
ND*	lb.	——	-	2.75
O*	lb.	——	-	6.50
OS*	lb.	——	-	5.25
Bouquet 149*	lb.	——	-	3.00
Coumarin*	lb.	3.60	-	3.70
Curodex 19*	lb.	4.75	-	4.90
188*	lb.	5.75	-	5.90
198*	lb.	6.75	-	6.90
Deodorant 65*	lb.	——	-	1.85
Deodorant L-37*	lb.	2.15	-	2.25
L-44*	lb.	2.65	-	2.75
N.L.T.X.*	lb.	1.90	-	2.00
Deodorant Oil GD 6422*	lb.	1.90	-	2.20
GD 6423*	lb.	1.60	-	1.90
GD 6575*	lb.	2.40	-	2.90
GD 31063*	lb.	2.25	-	2.75
Ethavan*	lb.	6.20	-	6.25
Latex Perfume 17326	lb.	——	-	4.00
18301	lb.	——	-	3.00
22258	lb.	——	-	2.50
Naugaromes* (dms.)	lb.	.60	-	3.00
Neutroleum Delta*	lb.	——	-	2.60
Gamma*	lb.	——	-	3.60
Parador A*	lb.	1.80	-	2.10
C*	lb.	2.00	-	2.50
E*	lb.	.25	-	.40
GD 5280*	lb.	2.00	-	2.50
GD 53481*	lb.	1.70	-	2.00
Perfume Oil Bouquet Vanilla M*	lb.	1.60	-	1.70
Rodo No. 0*	lb.	4.00	-	4.50
No. 10*	lb.	5.00	-	5.50
Rubbarome* (dms.)	lb.	.60	-	3.80
Rubber Perfume 12*	lb.	——	-	4.35
Russian Leather 7*	lb.	——	-	4.35
Vanillin	lb.	2.75	-	2.80

BLOWING AGENTS

Ammonium Bicarbonate	cwt.	——	-	8.00
Better Blend Soda* (c.l., bags)	cwt.	——	-	2.55
Blowing Agent CP-975*	lb.	.32	-	.35
Celogen*	lb.	——	-	1.95
AZ*	lb.	——	-	1.95
Diazo Amino Benzene	lb.	——	-	.73
Neo Fat 42-12*	lb.	.10¼	-	.12¼
Sodium Bicarbonate, U.S.P. (c.l., bags)	cwt.	——	-	2.40
Sponge Paste*	lb.	——	-	.20
Unicel ND*	lb.	——	-	.76
S*	lb.	——	-	.20
Urea	lb.	.06	-	.07

BONDING AGENTS

Base 6986*	lb.	.27	-	.32
Braze*	gal.	6.00	-	9.00
Cover Cement*	gal.	2.50	-	4.00
Durez 12987*	lb.	——	-	.54
Gen-Tac Latex*	lb.	.70	-	.75
Hylene M*	lb.	3.50	-	3.75
M-50*	lb.	1.90	-	2.15
Penacolite B1A*	lb.	——	-	.95
R-2710*	lb.	——	-	.95
Pliobond 20*	gal.	2.91	-	4.23
30*	gal.	3.65	-	4.97
Rex Compounds*	gal.	1.30	-	1.90
Thixons*	gal.	3.30	-	9.00
Ty-Ply Q (BN & S)*	gal.	6.75	-	8.00
Tygobond 30*	gal.	5.50	-	7.45
Vinculux	gal.	——	-	4.95

COAGULANTS

Acetic Acid—56% (bbls. cwt.		5.00	-	11.00
Glacial 99½% (dms.)	lb.	.12	-	.13
Calcium Nitrate, Tech. Flake	lb.	.12½	-	.15
Hydroxyacetic Acid—70% (dms.)	lb.	——	-	.095
Zinc Nitrate, Tech. Flake	lb.	——	-	.20

COLORING AGENTS

Black

Aquablak B*	lb.	.09¾	-	.10¼
M*	lb.	.10½	-	.11
R*	lb.	.10¾	-	.11¼
S*	lb.	.11¾	-	.12¼
Black Shield 4-35* (dms)	lb.	.09	-	.09½
No. 5	lb.	.10	-	.10½
No. 6	lb.	.09	-	.09½
L-1404B	lb.	.10½	-	.11
Carbon Black—*See Reinforcing Agents*				
Cooke 1026*	lb.	——	-	2.50
Lampblack No. 10*	lb.	.06	-	.09
Mapico Black Iron Oxide* (50 lb. bags)	lb.	.14¼	-	.14½
Pure Black Iron Oxide	lb.	.14¾	-	.14½

COLORING AGENTS (Cont'd)

Blue

Akron Masterbatches*	lb.	2.23	-	2.78
Toners*	lb.	2.30	-	6.35
Blue Powders	lb.	2.20	-	3.75
Cooke M.B. Blue*	lb.	2.20	-	3.75
Monastral Rubber Blue CPL*	lb.	——	-	1.95
PCD, Dispersed*	lb.	——	-	2.20
Peacoline Blue*	lb.	——	-	3.85
Ramapo Blue*	lb.	2.75	-	3.00
Rubber Blue GD* (Disp.)	lb.	——	-	4.75
Rubber Blue X-1999*	lb.	——	-	1.80
Rubber Dispersed Blues	lb.	2.52	-	2.78
Solfast Sky Blue*	lb.	3.00	-	3.60
Syntheline Blue*	lb.	——	-	3.85
Stan-Tone MBS*	lb.	1.55	-	4.55
GPE*	lb.	——	-	2.50
PC*	lb.	1.40	-	1.80
Ultramarine	lb.	.14	-	.30
Vansul Blue M.B.*	lb.	.95	-	2.60

Brown

Brown Iron Oxide	lb.	.15½	-	.15½
Mapico Brown* (50 lb. bags)	lb.	.15¼	-	.15½
Stan-Tone GPE*	lb.	——	-	3.00
Vansul Brown M.B.* (Organic)	lb.	——	-	2.15

Green

Akron Masterbatches*	lb.	1.38	-	3.08
Toners*	lb.	1.35	-	4.95
Cooke M.B. Green*	lb.	1.60	-	2.80
1013*	lb.	——	-	2.80
Filo Green*	lb.	——	-	.34
Green Powders	lb.	1.35	-	3.95
Monastral Rubber Green GSD* (Dispersed)	lb.	——	-	2.66
GSL*	lb.	——	-	2.20
Permansa Green CP-594*	lb.	——	-	1.35
Pigment Green B*	lb.	——	-	1.35
GL-652D*	lb.	.90	-	1.00
Ramapo Green*	lb.	——	-	3.50
Rubber Dispersed Greens	lb.	1.23	-	3.08
Rubber Green FD* (Disp.)	lb.	——	-	2.05
Rubber Green X-1292*	lb.	——	-	1.55
Solfast Green*	lb.	——	-	3.95
Stan-Tone MBS*	lb.	1.55	-	3.35
GPE*	lb.	3.00	-	4.50
PC*	lb.	1.70	-	3.80
Vansul Green M.B.*	lb.	1.05	-	2.90

Maroon

Akron Masterbatches*	lb.	——	-	4.10
Toners*	lb.	2.00	-	4.00
Maroon Powders	lb.	.79	-	3.60
Pyrolux Maroon*	lb.	——	-	3.65
Vansul Maroon M.B.*	lb.	——	-	3.35

Orange

Akron Masterbatches'	lb.	2.42	-	2.77
Toners*	lb.	2.82	-	4.00
Benzidene Orange	lb.	——	-	3.00
Cooke MB*	lb.	2.25	-	2.35
1021*	lb.	——	-	2.25
Mercadium X-2667*	lb.	——	-	1.78
Molybdate Orange	lb.	——	-	.46½
Oswego Orange X2065*	lb.	——	-	3.00
Rubber Orange GD* (Disp.)	lb.	——	-	2.25
Solfast Orange*	lb.	——	-	2.25
Stan-Tone Cadmium Dry*	lb.	2.02	-	4.45
Cadmium Paste*	lb.	2.47	-	3.20
GPE*	lb.	1.20	-	4.35
PC*	lb.	.75	-	2.75
Vansul Orange M.B.*	lb.	2.40	-	2.45

Red

Akron Masterbatches*	lb.	1.00	-	3.53
Toners*	lb.	.88	-	5.60
Arcturus Reds*	lb.	——	-	1.13
Antimony Trisulfide	lb.	.72	-	.78
R.M.P. Sulfur Free*	lb.	——	-	.78
R.M.P. No. 3*	lb.	——	-	.72
Brilliant Toning Reds*	lb.	1.65	-	1.95
Cadmolith Red* (dms.)	lb.	2.37	-	3.82
Cooke M.B. Red*	lb.	1.05	-	3.25
1010*	lb.	——	-	1.75
Graphic Red (dlvd.)	lb.	.88	-	.93
Kroma Reds*	lb.	.14	-	.15
Lake Red C*	lb.	——	-	1.13
Mapico Reds* (50 lb. bags)	lb.	.13¾	-	.14
Mercadium X-2668 Light*	lb.	——	-	1.95
X-2669 Medium Light*	lb.	——	-	2.10
X-2670 Medium*	lb.	——	-	2.25
X-2671 Dark*	lb.	——	-	2.40
Oximony Red Iron Oxide	lb.	.12¾	-	.13
Plasticone Reds*	lb.	——	-	4.60
Polaris Red*	lb.	——	-	1.65
Recco Red Oxide*	lb.	.12	-	.13
Red Iron Oxide, Light	lb.	.13¾	-	.14
Red Powders	lb.	——	-	4.40
Rubber Dispersed Reds	lb.	1.47	-	3.58
Rubber Red PBD* (Disp.)	lb.	——	-	1.90
2BD, Dispersed*	lb.	——	-	1.80
2BL*	lb.	——	-	1.24
PBL*	lb.	——	-	1.24
Rubanox Reds*	lb.	1.40	-	1.50
Rubber Red CP-339* (dlvd.)	lb.	——	-	1.10
Rubber Red X-1148*	lb.	——	-	.93
Solfast Red*	lb.	1.40	-	1.50
Stan-Tone MBS*	lb.	1.20	-	3.53
GPE*	lb.	1.65	-	2.00
PC*	lb.	1.30	-	2.50
PDS*	lb.	1.40	-	1.55
PVC*	lb.	1.65	-	1.90
Vansul Red M.B.*	lb.	1.00	-	3.35
Watchung Red*	lb.	1.65	-	1.95

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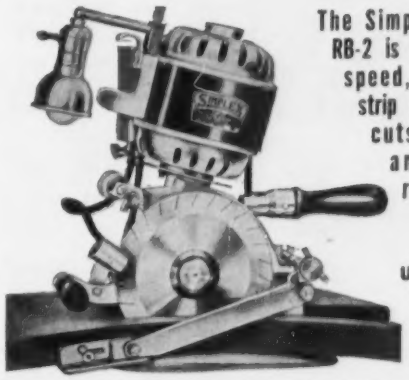
REG. TRADE MARK

CUT 2500 FEET OF STRIP PER HOUR



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U. S. Patent 2,294,497

The new Model RB-2 has a maximum cutting thickness of two inches, weighs 44.5 pounds, and is available in both A.C. and D.C. types. Manually operated, the machine is capable of cutting up to 20,000 feet of rubber strip in eight hours. A series of slits in the edge of the cutting blade carries water from a reservoir into the cut and not just to the top of the rubber being cut. This method lubricates the entire cut and produces a straight and even edge.

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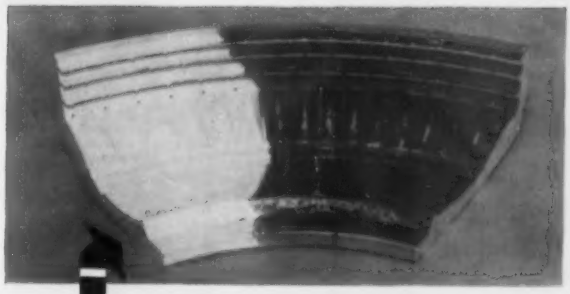

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COLORING AGENTS (Cont'd)

Tan

Mapico Tan 15* ($0 lb. bags)	lb.	.20¼	.21
20* (50 lb. bags)	lb.	.20¼	.20½

White—Lithopone

Eagle-Picher*	lb.	.0800	.0975
Permolith*	lb.	.0800	.0875
Sunolith*	lb.	.0800	.0875

White—Titanium Pigments

Horse Head Anatase Grades*	lb.	.24½	.25½
Rutile Grades*	lb.	.25½	.26½
Stan-Tone PC*	lb.	—	.55
Ti-Cal*	lb.	.09	.09¼
R-25*, R-22*, R-27*, R-30*	lb.	.09	.09½
R-60*	lb.	.09¼	.09¾
Ti-Pure*	lb.	.24½	.27½
Anatase Grades*	lb.	.24½	.25½
Rutile Grades*	lb.	.26½	.27½
Titanox A*—all grades (dlvd.)	lb.	.24½	.25½
C-50* (dlvd.)	lb.	.13¾	.14½
RA* (dlvd.)	lb.	.26½	.27½
RA-10* (dlvd.)	lb.	.26½	.27½
RA-NC* (dlvd.)	lb.	.26½	.27½
RC* (dlvd.)	lb.	.09¼	.09¾
RC-HT* (dlvd.)	lb.	.09	.09½
Unitane O-110*	lb.	—	.245
Unitane O-110*	lb.	.24½	.25½
O-220*	lb.	.24½	.25½
O-310*	lb.	.24½	.25½
O-410*	lb.	.24½	.25½
OR-150*	lb.	.26½	.27½
OR-250*	lb.	.26½	.27½
OR-340*	lb.	.26½	.27½
OR-342*	lb.	.26½	.27½
OR-350*	lb.	.26½	.27½
OR-540*	lb.	.26½	.27½
OR-640*	lb.	.26½	.27½
Zopaque*	lb.	.24½	.25½
R*	lb.	.26½	.27½

White—Zinc Oxide (American Process)

AZO-DOX 44, 45	lb.	.1450	.1550
AZO-ZZZ 11* (22*, 33*, 44*, 55*)	lb.	.1450	.1550
Eagle-Picher AAA*	lb.	.1450	.1550
Horse Head Special*	lb.	.1450	.1550
XX*	lb.	.1450	.1550
Protox 166*	lb.	.1450	.1550
167*	lb.	.1450	.1550
267* (pelleted)	lb.	.1450	.1550
St. Joe Black Label*	lb.	.1450	.1550
Green Label*	lb.	.1450	.1550
Red Label*	lb.	.1450	.1550
Pelleted	lb.	.1450	.1550

White—Zinc Oxide (Dispersed)

Dispersed Zinc Oxide	lb.	—	.13

White—Zinc Oxide (French Process)

AZO-ZZZ 66	lb.	.1450	.1550
Florence Green Seal*	lb.	.1625	.1725
Red Seal*	lb.	.1575	.1675
White Seal*	lb.	.1675	.1775
Kadox 25*	lb.	.1675	.1775
15*, 17*, 72* & 515*	lb.	.1450	.1550
Protox 168*	lb.	.1450	.1550
169*	lb.	.1450	.1550
268* (pelleted)	lb.	.1450	.1550
U.S.P. (cartons)	lb.	.1775	.1875
XX-78*	lb.	.1450	.1550

White—Zinc Sulfide

Cryptone ZS*	lb.	.2530	.2630
Lehigh 35%*	lb.	.1550	.1650
50%*	lb.	.1585	.1685

Yellow

Akron Masterbatch*	lb.	1.12	2.18
Toners*	lb.	2.10	6.00
Benzidene Lightfast	lb.	2.75	3.50
Benzidine Yellow	lb.	2.10	2.35
Cadmolith Yellow* (dms.)	lb.	1.20	—
Chrome Yellow	lb.	—	.33½
Cooke M.B. Yellow 405*	lb.	2.15	2.75
105*	lb.	—	2.15
Iron Oxide, Pure			
Light Shades	lb.	.12	.12¼
Dark Shades	lb.	.11½	.11¾
Mapico Yellow* (50 lb. bags)	lb.	.12	.12¼
Rubber Dispersed Yellows	lb.	**1.27**	**2.13**
Rubber Yellow GD* (disp.)	lb.	—	2.25
GL*	lb.	—	1.68
Rubber Yellow X-1940*	lb.	—	**2.35**
Stan-Tone Cadmium Dry*	lb.	2.80	3.03
Cadmium Paste*	lb.	1.63	1.99
MBS*	lb.	1.30	2.20
GPE*	lb.	4.25	4.50
PC*	lb.	.55	3.40
Sumatra Yellow X-1940*	lb.	—	2.35
Toluidine Yellow	lb.	2.00	2.10
YL-660 D*	lb.	1.20	1.25
Oximony Iron Oxide	lb.	.12¾	.13
Vansul Yellow M.B.*	lb.	1.00	2.00
Yellow Powders	lb.	**2.00**	5.00
Zinc Yellow	lb.	—	.27½

DISPERSING AGENTS

Anchoid*(†)	lb.	**.24**	.25
Anhydrapent*	lb.	.56	.59
Armeen 18*	lb.	.39	.45
Blancol*	lb.	—	.15¾
Darvan No. 1* (and No. 2*)	lb.	.22	.30
Daxad 11* (21*, 23*)	lb.	.08	.30
Diethanolamine (dms., dlvd.)	lb.	.24½	.27½
Dispersaid*	lb.	1.25	1.35
Emcol K-8300* (dms.)	lb.	.14	.18
P10-59	lb.	.32	—
5120	lb.	.31	—
5138	lb.	.31	—
Emulphor ON-870*	lb.	—	.55
Furala*	lb.	.06½	.07½
Halloid*	lb.	.04½	.05½
Hyeryl A-1000*	lb.	.09	.09½
Igepal CO-630*	lb.	—	.29
Igepon T-73*	lb.	—	.29½
Kyro EO* (dms.)	lb.	—	.29¾
Leonil SA*	lb.	—	.55
Lomar PW*	lb.	—	.18
Marasperse C*	lb.	.06¾	.06¾
CB*	lb.	.13	.15
N*	lb.	.09½	.10½
Monoethanolamine (dms., dlvd.)	lb.	.25	.28
Naccotan A*	lb.	.16½	.17
Nekal BA-75*	lb.	—	.40
BX-78*	lb.	—	.64
Nopco 1187-X*	lb.	.15	.16
Pluronic F68*	lb.	.38½	.44
Polyfon*	lb.	.08	.09
R & R 551*	lb.	—	.28
Rubbex*	lb.	.247	.277
Stablex B*	lb.	.50	.95
Stan-Chem BQC*	lb.	.12¼	.17¼
1067*	lb.	—	.13½
1471*	lb.	.1687	.2187
2251*	lb.	.12¼	.17¼
Trenamine D-25*	lb.	.32½	.36
Triethanolamine (dms., dlvd.)	lb.	.22	.25
Yelkin TT* (and TTS*)	lb.	.13	.16

EXTENDERS

Arco 1071-13B*	lb.	.14½	.15½
1073-18B*	lb.	.13½	.14½
1294-36B*	lb.	.11½	.12½
Car-Bel-Ex-A* (and B*)	lb.	—	.14
Extender 600*	lb.	—	.1765
Facile Gum 4A*	lb.	.48	.50
Millex*	lb.	—	.07
W*	lb.	—	.07
Nopco 2271*	lb.	.15½	.16½
Polyco 418*	lb.	.17	.18
PR-162 Latex Extender*	lb.	—	.182
Solvitose HDF*	lb.	.22	.25
Synprolac*	lb.	.16	.23
Synprowax*	lb.	—	.23
Vistanex*	lb.	—	.35

FILLERS (Inert and Reinforcing)

Abrasives			
Carbonite*	lb.	.21½	1.35
Lionite*	lb.	.16	1.27
Pumice	lb.	.03	.05
Walnut Shell Grits	lb.	.05	.08
Aluminum Hydrate	lb.	.0850	.1200
Kaiser Alumina*	lb.	.026	.059
Aluminum Silicate			
AFD*	ton	26.50	60.00
Aluminum Flake*	ton	23.50	32.50
Marter White*	ton	18.50	30.00
Barium Carbonate (l.c.l.)	ton	95.50	-100.00
Barytes			
No. 1 Floated, White*	ton	45.00	65.10
No. 2 Floated, Unbleached*	ton	43.00	63.10
No. 22 Barytes* (c.l.)	ton	—	30.00
No. 3805 Barytes*	ton	22.00	26.75
Foam A*	ton	—	45.00
Sparmite*	ton	80.00	85.00
XIOR*	ton	80.00	85.00
Bentonite (c.l.)	ton	—	13.50
Argosite Clay* (c.l.)	ton	—	12.50
Bennett Clay* (c.l.)	ton	—	32.50
SPV Volclay* (c.l.)	ton	—	12.50
White Hi-Gel*	ton	—	65.90
Blanc Fixe	ton	72.50	-120.00
Calcium Carbonate			
Atomite* (c.l.)	ton	—	32.50
B.I. White No. 1 (c.l.)	ton	—	9.00
Calcene NC*	ton	72.50	92.50
TM*	ton	75.00	95.00
Calwhite*	ton	—	20.00
Camel-Carb*	ton	—	12.00
Camel-Tex*	ton	—	20.00
Camel-Wite*	ton	—	32.50
Duramite*	ton	—	20.00
Gamaco* (c.l.)	ton	—	32.50
Georgia Marble 5-25* (c.l.)	ton	—	20.00
No. 10 White* (c.l.)	ton	—	11.00
Kalite*	ton	50.00	65.00
Laminar*	ton	—	30.00
Lexamite* (c.l.)	ton	—	27.50
Lorite*	ton	30.00	36.00
Millical*	ton	38.00	53.00
Multifex MM*	ton	110.00	-125.00
Non-Fer-Al*	ton	32.50	37.50
Purecal M*	ton	56.75	80.75
SC* (and T*)	ton	110.00	-125.00
U*	ton	120.00	-135.00

FILLERS (Cont'd)

Calcium Carbonate (cont'd)			
Rambo No. 1*	ton	—	10.50
Snowflake*	ton	17.00	20.00
Super Multifex*	ton	160.00	-175.00
Surfex*	ton	37.50	52.50
Suspenso*	ton	35.50	50.50
Witcarb Reg.*	ton	56.75	85.00
P*	ton	110.00	-140.00
R*	ton	120.00	-150.00
RC*	ton	110.00	-140.00
York White*	ton	—	10.50
Calcium Silicate			
Silene EF*	ton	120.00	-140.00
Calcium Sulfate, Anhydrous			
Snow White Filler*	ton	—	20.50
Calcium Sulfate Hydrous			
Terra Alba No. 1*	ton	—	16.00
Chalk Whiting (l.c.l.)	lb.	.01½	.01¼
Recco Paris Whiting*	ton	—	35.00
OMYA Whiting*	ton	—	30.00
Clay			
Afton Clay*	ton	12.00	35.50
Aiken Clay*	ton	—	13.00
Alsilite* (c.l.)	ton	30.00	45.00
Alsite* (c.l.)	ton	—	14.00
Aluminum Flake*	ton	23.50	30.00
Buca* (c.l.)	ton	—	45.00
Burgess No. 20*	ton	—	35.00
No. 30*	ton	—	37.00
Burgess Iceberg*	ton	—	50.00
Catalpo* (c.l.)	ton	—	35.00
Champion*	ton	—	14.00
C.S.D.* (c.l.)	ton	—	13.50
Crown*	ton	—	14.00
Dixie* (c.l.)	ton	—	14.00
Franklin Clay—R* (c.l.)	ton	15.00	39.00
G. K. Soft*	ton	11.00	28.00
Harwick Clays*	ton	14.50	57.00
Hi-White R*	ton	—	13.50
Kaolloid Clay* (c.l.)	ton	—	10.50
LGB*	ton	—	17.00
LGP*	ton	—	19.00
McNamee* (c.l.)	ton	—	13.50
Natka 1200 (c.l.)	ton	—	12.00
Par* (c.l.)	ton	—	12.00
Paragon*	ton	—	13.50
Pigment 5*	ton	23.50	26.50
33*	ton	—	37.00
Recco* (c.l.)	ton	—	14.00
Swanee Clay*	ton	—	12.50
Snobrite*	ton	—	12.50
Suprex*	ton	—	14.00
Whitetex* (c.l.)	ton	—	50.00
4200 Clay*	ton	—	11.00
Diatomaceous Earth	ton	30.00	50.00
Kaylorite* (c.l.)	ton	—	30.00
Lorite*	ton	—	30.00
Flock			
Cotton (White)	lb.	.28	.32
Colored	lb.	.11	.13½
Filfloc F 40-9000*	lb.	—	.13
F 6000*	lb.	—	.36
Polycel*	ton	110.00	-210.00
Rayon, Bleached or Dyed	lb.	.75	1.20
Rayon, Grey	lb.	—	.18
Rayon, Pink	lb.	—	.20
Solka-Floc* (l.c.l.)	lb.	.07	.16
Glue, Amber	lb.	.17	.19
Ground Softwood Bark Silvacon* (c.l.)	ton	55.00	-100.00
Leather			
Flour (dust)	lb.	.12	.15
Shredded	lb.	.05	.17
Lignin	lb.	.06	.08
Indulin*	lb.	.06	.08
Limestone, Pulverized	ton	3.00	5.00
Asbestol Regular*	ton	27.00	29.00
Asbestol Superfine*	ton	32.00	34.00
Georgia Marble No. 10*	ton	—	11.00
Industrial Filler No. 100*	ton	—	5.75
Micro Velva A*	ton	49.00	51.00
L*	ton	57.00	59.00
No. 1 White*	ton	—	10.00
Magnesium Carbonate	lb.	.12½	.15
K & M Clearcarb*	lb.	—	.14
Technical* (c.l., eqld.)	lb.	.10½	.12
Marinco CL*	lb.	—	.12
Magnesium Silicate (see Talc)			
Mica	lb.	.01¼	.07¾
Concord*	lb.	.08	.08¼
Micro-Mica*	lb.	.08	.08¼
Mineralite* (c.l.)	ton	40.00	85.00
Silversheen*	lb.	.08	.08¼
Triple A Mica* (c.l.)	ton	—	30.00
Vermiculite*	lb.	—	.11
Wet Ground Biotite Mica	lb.	.06½	.07¼
Wet Ground Mica No. 160*	lb.	.08	.08¼
Pecan Shell Flour Stan Shell*	ton	45.00	75.00
Pyrophyllite			
No. 261*	ton	—	11.50
Pyrax A* (c.l.)	ton	—	13.50
WA* (c.l.)	ton	—	16.00
Sawdust, Graded	ton	14.00	35.00
Silica	ton	16.00	27.00
DC Silica (pelleted)	lb.	1.45	1.65
Extra Fine (bags) (c.l.)	ton	—	43.00
Slate, Powdered (l.c.l.)	ton	15.00	20.00
Lo-Micron Slate Flour*	lb.	—	.04½
No. 133 Slate Flour*	ton	—	4.55
Sodium Silico Aluminate Zeolex 23*	ton	120.00	-140.00

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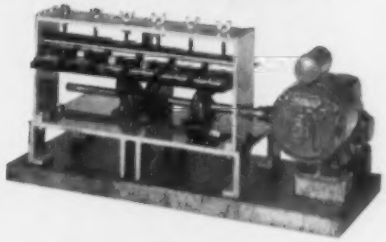
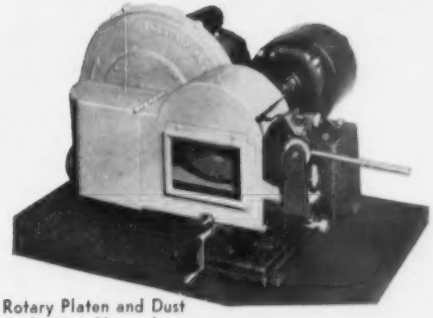
ROSS RUBBER FLEXING MACHINE (for ASTM D1052)



RUBBER SAMPLE BUFFING MACHINE



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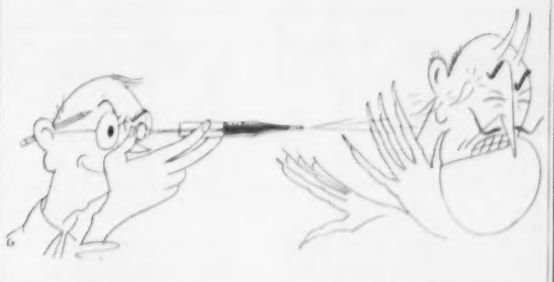

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Asbestol Regular*	ton	—	27.00
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No. 41*	ton	—	19.70
No. 549*	ton	—	63.00
French*	ton	—	59.00
L.S. Silver*	ton	33.75	38.75
No. 367*	ton	—	13.00
No. 1600*	ton	—	70.60
No. 1768*	ton	—	13.00
Nytal 200* (c.l.)	ton	—	28.00
300* (c.l.)	ton	—	38.00
Sierra Fibrene C-400*	ton	33.00	38.00
Supreme 325*	ton	46.25	57.25
Sierra White*	ton	20.75	31.75
Soapstone*	ton	—	13.00
Walnut Shell Flour	ton	55.00	100.00
Stan-Shell*	ton	40.00	80.00
Whiting, Commercial	ton	—	7.50
Allied Whiting*	ton	10.50	21.50
Camel-Carb*	ton	—	10.00
Calwhite (c.l.)	ton	—	20.00
C-C-O White*	ton	20.00	22.50
Georgia Marble No. 15*	ton	—	20.00
No. 16*	ton	—	20.00
Pigua No. 1 YAA* (c.l.)	ton	—	9.00
No. 2 LS* (c.l.)	ton	—	9.00
Snowflake* (c.l.)	ton	—	20.00
Stan-White 325*	ton	10.50	13.10
Veroc* (c.l.)	ton	—	10.50
Welco* (c.l.)	ton	—	10.50
York White R* (c.l.)	ton	—	10.00
Wood Flour	ton	31.50	48.00

FINISHING MATERIALS, SURFACE

Beaco Finishes*	gal.	2.10	2.35
Black Out*	gal.	4.50	8.00
Shellac, Orange Gum	lb.	.50	.60
VanWax*	gal.	1.45	1.50

FLAME RETARDANTS

Cellulflex CEF* (dms.)	lb.	—	.65
Chlorowax 40*	lb.	.15¼	.17¼
50*	lb.	.16¼	.17¾
70*	lb.	.18½	.20
Halowax*	lb.	.35½	.61½
Zinc Borate 3167*	lb.	.1920	.2020
Zyrox Compounds*	lb.	.38	.95½

LATEX MODIFIERS

Ludox	lb.	.15	.16¾
OPD-101*		—	.28
Piccopale A-1 Emulsion	lb.	.086	.107
Uhatol U-2001* (dms.)	gal.	1.84	1.87

LUBRICANTS, MOLD

Akro Gel*	lb.	—	.165
Alipal CO-433*	lb.	—	.20
CO-436*	lb.	—	.24
Aluminum Stearate Crown Brand*	lb.	.37	.42
Amine, Mixed Crude*	lb.	.19	.25
Aquadag*	lb.	3.50	4.00
Aquarex D*	lb.	—	.78
L*	lb.	—	.94
ME*	lb.	—	.80
MDL*	lb.	—	.33
WAQ*	lb.	—	.22
Armeen HT*	lb.	.34	.40
180*	lb.	.52	.56
Armid HT (flaked)*	lb.	.42	.46
0*	lb.	.39	.41
Borax, Granular (l.c.l.)	ton	89.00	94.00
Carbowax 4000*	lb.	.31	.32
CD Mold Release B*	gal.	5.00	—
B-2*	gal.	5.00	—
Colite Concentrate* (dms.)	gal.	.90	1.15
Colite D43D*	gal.	1.15	1.40
Concentrex*	lb.	—	.25
Dag Dispersions No. 197*	lb.	1.85	2.90
D.C. 7 Compound*	lb.	5.13	6.50
D.C. Emulsion No. 7*	lb.	1.59	2.07
No. 8*	lb.	1.22	1.76
No. 15*	lb.	1.22	1.76
No. 35A*	lb.	1.22	1.76
No. 35B*	lb.	1.22	1.76
No. 36*	lb.	1.22	1.76
D.C. Mold Release Fluid*	lb.	3.14	4.75
Dri-Lube*	lb.	—	.22
Emulsion Lubricant A80*	lb.	—	1.80
45*	lb.	—	1.80
G-E Silicone Emulsion SM-55*	lb.	1.22	1.76
SM-61*	lb.	1.22	1.76
SM-62*	lb.	1.22	1.76
G-E Silicone Fluid SF-93*	lb.	3.14	4.25
SF-96*	lb.	3.14	4.25
Glydag G*	lb.	1.30	2.45
Hawkeye Flake* (dlvd.)	lb.	.15	.15¾
HSC No. 35*	lb.	1.22	2.46
No. 515	lb.	1.22	2.46
Igepal CO-430*	lb.	—	.29
CO-630*	lb.	—	.29
CO-530*	lb.	—	.29
Igepon AP-78*	lb.	—	.48
T-33*	lb.	—	.21
T-51*	lb.	—	.13½

LUBRICANTS, MOLD (Cont'd)

Kokobace R*	lb.	.17½	.18½
Lubrex	lb.	.25	.30
Lubri-Flo*	gal.	10.00	12.00
Migralube*	lb.	—	.35
ML-1027-2C*	gal.	—	2.15
ML-1028-2C*	gal.	—	2.15
Mold Lubricant No. 72 Conc.* (dms.)	gal.	—	1.90
No. 735* (dms.)	gal.	—	1.25
No. 769* (dms.)	gal.	—	1.20
No. 825* (dms.)	gal.	—	2.00
No. 856* (dms.)	gal.	—	1.90
No. 880* (dms.)	gal.	—	1.19
No. 887* (dms.)	gal.	—	1.80
No. 896* (dms.)	gal.	—	1.28
No. 935* (dms.)	gal.	—	1.56
No. 956* (dms.)	gal.	—	2.50
No. 965* (dms.)	gal.	—	2.15
No. 967* (dms.)	gal.	—	2.40
No. 969* (dms.)	gal.	—	1.50
No. 975* (dms.)	gal.	—	2.85
No. 980* (dms.)	gal.	—	1.53
No. 987* (dms.)	gal.	—	2.45
Moldeze No. 3*	gal.	—	4.95
Mold-Brite*	gal.	—	1.50
Monopole Oil MD*	lb.	—	.16
Olate Flakes*	lb.	.22	.23
Orvus WA Paste* (dms.)	lb.	—	.22
Plaskon Polyethylene S*	lb.	.32	.47
Polyglycol 15-200*	lb.	.25	.28¼
E4000*	lb.	.31	.37
Prodag*	lb.	.28	.42
Purity Flake* (dlvd.)	lb.	.18	.19¼
Rubber-Flo*	gal.	1.25	2.00
Rubber-Glo*	gal.	—	.94
Rusco Mold Paste*	lb.	—	.25
Sericite* (l.c.l.)	ton	65.00	75.00
Silicone Oil A145*	lb.	3.18	3.61
Silrex (dms.)	lb.	—	.65
A65*	lb.	2.50	2.75
Soybean Lecithin	lb.	.13	.17
Thermalube*	lb.	—	.13¾
UC Silicone L-45*	lb.	3.14	4.75
L-522*	lb.	3.05	4.05
LE-45*	lb.	1.22	1.70
LE-450*	lb.	1.22	1.70
Ucon Lubricants*	lb.	.26¼	.27¼
Ulco Mold Soap*	lb.	.15	.29

LUBRICANTS, RUBBER

Diglycol Stearate Neutral (and SE) (dms.)	lb.	—	.25
Extrud-o-Lube*	gal.	1.33	1.54
G.B. Naphthenic Neutrals*	gal.	.11	.18
Ivory Chips*	lb.	.18½	.19¼
Latex-Lube GR* (dlvd.)	lb.	.19¼	.20
No. 82-A* (450 lb. dms.)	lb.	—	.08½
Propylene Stearate (dms.)	lb.	.35	.60

LUBRICANTS, RUBBER SURFACE

Barium Stearate	lb.	.39	.44
Calcium Stearate	lb.	.37	.42
Crown Brand*	lb.	.37	.42
D.C. 7 Compound*	lb.	5.13	6.50
D.C. 200 Fluid*	lb.	3.14	4.75
ELA*	lb.	—	.82
G-E Silicone Fluid SF-92*	lb.	3.14	4.25
Glycerized Lubricant*	gal.	1.25	1.48
Glydag B*	lb.	1.50	2.10
G*	lb.	1.30	2.45
Glyso-Lube* (dms.)	lb.	—	.14
No. 3* (dms.)	lb.	—	.14
HSC No. 35*	lb.	1.28	1.34
No. 515*	lb.	1.28	1.34
Hydro-Zinc*	lb.	—	.20
Latex-Lube Pigmented* (dlvd.)	lb.	.17¼	.18¼
R-66*	lb.	—	.16½
Liqui-Lube* (dlvd.)	lb.	—	.16¼
N.F.* (dlvd.)	lb.	—	.16¾
N.T.* (dlvd.)	lb.	—	.16¾
Lubrex*	lb.	.25	.30
Lubri-Cote	gal.	.86	1.00
Magnesium Stearate Crown Brand*	lb.	.40	.45
Polyethylene Glycol	lb.	.22	.26
Rubber Free (Concentrate)*	gal.	—	1.44
Jel*	lb.	.18	.21½
Slab-Dip* (dms.)	lb.	—	.15
Soybean Lecithin	lb.	.13	.17
Stock-Lube*	lb.	—	.19
UC Silicone L-45*	lb.	3.14	4.75
L-522*	lb.	3.05	4.05
LE-450*	lb.	1.22	1.70
Zinc Stearate	lb.	.39	.44

MOLD CLEANERS

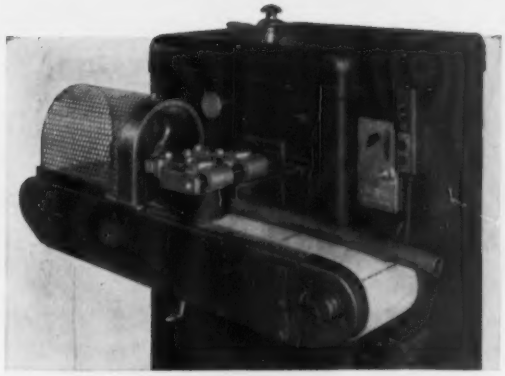
Actusol* (dlvd.)	gal.	1.45	1.65
Alkon* (dlvd.)	lb.	.16	.16½
CA-301*	gal.	—	2.49
CA-302*	gal.	—	2.63
G-O 6910*	lb.	.38	.40
Metso Anhydrous*	cwt.	5.35	7.60
Metso 99*	cwt.	4.80	7.05
200*	cwt.	6.30	8.55
Granular*	cwt.	4.25	6.50
Orvus Extra Granules*	lb.	.22½	.23½
Rubber-Sol*	gal.	2.97	3.97
Sprex A.C.* (dlvd.)	lb.	.17¼	.18¾
Zip Mold Cleaner*	gal.	.95	1.45

PEPTIZING AGENTS

Peptizer P-12*	lb.	.95	1.25
Pepton 22 Plasticizer*	lb.	.81	.84
65*	lb.	1.20	1.25
65B*	lb.	.81	.84
RPA 2*	lb.	—	.82
3*	lb.	—	.48
3 Conc.*	lb.	—	.85
5*	lb.	—	.68
6*	lb.	—	1.62

PLASTICIZERS & SOFTENERS

Acto 500*	lb.	—	.09
Adipol BCA*	lb.	.47	.47½
2EH*	lb.	.42½	.45½
10A*	lb.	.42½	.45½
ODY*	lb.	.47	.50
810*	lb.	.42½	.45½
XX*	lb.	.42½	.45½
Anhydrol 6990*	lb.	.51	.56
Arneel SD*	lb.	.34	.40
Arolene 1980* (c.l.)	lb.	—	.10
Aromatic Plasticizer 10* (and 25*) (dms.)	lb.	.05	.06½
Aromatic Tar	gal.	.0573	.1973
Bardol*	lb.	.02¾	.03¾
B*	lb.	.06¼	.06½
Bayol D*	gal.	—	.382
F*	gal.	—	.52
Beeswax, Bleached	lb.	.76	.79
Yellow Refined	lb.	.68	.70
Bondogen*	lb.	.55½	.60½
B.R.C. No. 20*	lb.	.0150	.0175
No. 21*	lb.	.02¼	.03
No. 22*	lb.	.02½	.02¾
B.R.H. 2*	lb.	.0213	.0351
BRS 700*	lb.	.0200	.0285
B.R.T. 3*	lb.	.0180	.0265
4*	lb.	.0250	.0260
7*	lb.	.0300	.0310
B.R.V.*	lb.	.0475	.0565
Bunarex Resins*	lb.	.07	.08
Bunatak AH*	lb.	—	.09½
N*	lb.	—	.31
U*	lb.	—	.17½
No. 90*	lb.	—	.09
No. 210*	lb.	—	.14
Butac*	lb.	.12½	.13½
Butyl Carbitol Periargonate (dms.)	lb.	—	.64½
Butyl Cellosolve Periargonate (dms.)	lb.	—	.68
Butyl Oleate	lb.	.23¼	.26
Butyl Palmitate	lb.	—	.26½
Butyl Stearate (dms.)	lb.	.22¾	.24¼
BWH-1*	lb.	.16	.17
Cabflex DDA*	lb.	.40	.43½
DDP*	lb.	.29½	.33
Di-BA*	lb.	.41	.44½
Di-OA*	lb.	.40	.43½
Di-OP*	lb.	.28½	.32
Di-OZ*	lb.	.45½	.49
DOA*	lb.	.40	.43½
DOP*	lb.	.28½	.32
HS-10	lb.	.44	.47½
ODA*	lb.	.40	.43½
ODP*	lb.	.29	.32½
TCP*	lb.	.34½	.38
Califlux 510* (and 550*)	lb.	.02½	.03¼
G.P.*	lb.	.01¾	.02
R-100*	lb.	.04½	.05¼
TT*	lb.	.0170	.0245
Candelilla Wax, Prime	lb.	.70	.74
Refined Light	lb.	.73	.78
Carbowax 4000* (dms.)	lb.	.31	.32
Carnauba Wax, Crude	lb.	.71	.77
Flaked	lb.	.72	1.55
Refined, Technical	lb.	.72	.80
Refined, Pure	lb.	.80	.86
Yellow	lb.	1.42	1.45
Cellulflex* (dms.) 112* (t.c., dlvd.)	lb.	—	.34½
179-A* (t.c., dlvd.)	lb.	—	.34½
179-C* (t.c., dlvd.)	lb.	—	.34½
179-EG* (t.c., dlvd.)	lb.	—	.34½
DBP* (t.c., dlvd.)	lb.	—	.30
DOP* (t.c., dlvd.)	lb.	—	.30½
TPP* (dms., eqld.)	lb.	—	.40
Ceresin Wax	lb.	.12	.30
Chlorowax 40*	lb.	.15¼	.17¼
50*	lb.	.16¾	.17¾
70*	lb.	.18½	.20
LV*	lb.	.17¼	.19¼
CTLA Polymer*	gal.	.20	.36
Cumar Resins*	lb.	.07	.19
Darex DBP*	lb.	.30	.33
DOP*	lb.	.30½	.33½
DIOP*	lb.	.30½	.33½
D.B.M.*	lb.	.32	.34¾
Decylbutyl Phthalate	lb.	.27	.29½
Degras, Common	lb.	—	.14
Diallyl Phthalate	lb.	.49¼	.52¼
Dibenzyl Sebacate	lb.	.88	.89½
Dibutoxyethyl Sebacate	lb.	—	.56¾
Dibutyl Phthalate	lb.	.30	.33½
Dibutyl Sebacate	lb.	.64½	.66
Dicapryl Adipate	lb.	.42	.44
Dicapryl Phthalate	lb.	.29½	.31
Dicapryl Sebacate	lb.	.58	.59½
Di-Carbitol Phthalate (dms.)	lb.	.42	.42½
Dicyclohexyl Phthalate	lb.	.58¾	.59¼
Diethyl Phthalate (t.c.)	lb.	.25	.27½
Di-2-ethylhexyl Phthalate	lb.	—	.30½
Dihexyl Adipate	lb.	.40	.42½
Dihexyl Phthalate	lb.	.30	.32½



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PLASTICIZERS & SOFTENERS (Cont'd)

Dihexyl Sebacate	lb.	.62	- .63½
Diisobutyl Azelate	lb.	—	- .47¾
Di-iso-octyl Adipate	lb.	.40	- .42½
Di-iso-octyl Phthalate (t.c.)	lb.	.30½	- .33
Dimethyl Phthalate (t.c.)	lb.	.27½	- .30¼
Dimethyl Sebacate	lb.	1.25	- 1.26½
Dinonyl Adipate	lb.	.44½	- .47½
Dinopol 235*	lb.	.35½	- .38½
IDO*	lb.	.30½	- .33½
MOP*	lb.	.32½	- .35½
Dioctyl Adipate	lb.	.40	- .42½
Dioctyl Phthalate (dms.)	lb.	.33	- .34
Dioctyl Sebacate (dms.)	lb.	.58½	- .60
D.I.O.P. (dms.)	lb.	.30½	- .34
Dipolymer Oil	gal.	.33	- .48
Dispersing Oil No. 10*	lb.	.06	- .06¼
Dutrex 6*	gal.	—	- .11
15E*	gal.	—	- .10
Elastex 10-P*	lb.	.30½	- .33½
50-B*	lb.	.25	- .28
DCHP*	lb.	.59	- .60
Emulphor EL-719*	lb.	—	- .58
Epoxy Plasticizer	lb.	.33½	- .36
Drapex 3.2*	lb.	.39¾	- .44
Drapex 4.4*	lb.	.37	- .42
Esparto Wax	lb.	—	- .55
Estac*	lb.	—	- .16
Facile Gum 4A*	lb.	.48	- .50
Flexol B-400*	lb.	.27½	- .28½
DOP*	lb.	.33	- .34
TOF*	lb.	.45½	- .46½
3GH*	lb.	.46	- .46¾
3GO*	lb.	.55	- .55¾
4GO*	lb.	.35	- .36
426*	lb.	.29½	- .30½
Flexricin P-1*	lb.	—	- .32
P-4*	lb.	—	- .31
P-6*	lb.	—	- .37
P-8*	lb.	—	- .33
Fortex A* (dms.)	lb.	.12½	- .14½
Galex W-100*	lb.	.15½	- .19¾
G.B. Asphaltic Flux*	gal.	.10	- .18
G.B. Light Process Oil*	lb.	.02½	- .03¼
Medium Process Oil*	lb.	.03½	- .04¼
G.B. Naphthenic Neutrals*	gal.	.11	- .18
Good-rite GP233*	lb.	.40	- .43½
GP235*	lb.	.40	- .43½
GP236*	lb.	.40	- .43½
GP261*	lb.	.28	- .31½
GP265*	lb.	.28½	- .32
GP266*	lb.	.29	- .32½
GP-266-BPA*	lb.	.29	- .32½
Harflex 500* (dms.)	lb.	.31½	- .34
HB20*	lb.	.15	- .17
HB40*	lb.	.19	- .22
Herron-H.T.*	gal.	.16	- .27
Herron-Plas*	lb.	—	- .03¾
Herron-Wax*	lb.	.05¼	- .06
No. 23*	lb.	.08¼	- .08¾
No. 24*	lb.	.07¼	- .07¾
HSC No. 13*	lb.	.20	- .27
No. 28 and 38*	lb.	.20	- .27
Indonex 632½* (633¼*, 634½*, 637½*)	gal.	.12	- .19
Isooctyl Decyl Phthalate	lb.	.30½	- .33½
Kapsol*	lb.	.32¼	- .35¼
Kenflex*	lb.	.18	- .27
Kesscoflex 101* (dms.)	lb.	—	- .37½
103* (dms.)	lb.	—	- .38
MCO* (dms.)	lb.	—	- .35½
BCL* (dms.)	lb.	—	- .37½
MCP* (dms.)	lb.	—	- .41
BCP* (dms.)	lb.	—	- .36
KP 23*	lb.	.29	- .32
90*	lb.	.40	- .43
140*	lb.	.46	- .48½
201*	lb.	.58¼	- .59¼
220*	lb.	.31	- .34
555*	lb.	.45	- .47½
Kremol 40*	gal.	.36	- .46
50*	gal.	.39	- .49
Kronisol* (dms.)	lb.	.33	- .36
Kronitex AA* (dms.)	lb.	.34½	- .37½
I* (dms.)	lb.	.34½	- .37½
K-3*	lb.	.34½	- .37½
MX*	lb.	.34½	- .37½
Lanolin, Tech. Anhydrous	lb.	—	- .26
Latex-Lube G.R.*	lb.	.19¼	- .20
Lead Oleate	lb.	—	- .29½
Lindol* (dms., t.c.)	lb.	.34½	- .37½
Locusol No. 1-6980*	lb.	.30	- .34
2-Mercaptoethanol (dms.)	lb.	1.25	- 1.50
Methox*	lb.	.38½	- .41
Methyl Laurate	lb.	.25	- .27
Methyl Oleate	lb.	—	- .20
Methyl Stearate (dms.)	lb.	—	- .30
Monoplex DOS*	lb.	.59½	- .60½
DBS*	lb.	.65½	- .66½
S-70*	lb.	.41	- .42
S-71*	lb.	.46½	- .47½
Montan Wax, Crude	lb.	.26	- .35
Flaked	lb.	.29	- .40
Morflex*	lb.	.32	- .69½
MR 2088* (dms.)	lb.	—	- .19
Natac*	lb.	.12	- .13
Nelsony Resins* (dms.)	lb.	.04½	- .05
Neolene 210* (t.c.)	lb.	—	- .16
212* (t.c.)	lb.	—	- .14
220* (t.c.)	lb.	—	- .15
Nerium*	lb.	—	- .09
Nevillac Resins* (dms.)	lb.	.31	- .85
Neville LX-880* (dms.)	lb.	.12	- .13½
LX-685* (dms.)	lb.	.12½	- .17½
Neville Resins* (dms.)	lb.	.07¼	- .20
Nevindene Resins* (dms.)	lb.	.16½	- .20
Nevinol* (dms.)	lb.	—	- .24

PLASTICIZERS & SOFTENERS (Cont'd)

Nuba 1* (and 2*) (dms.)	lb.	.06¼	- .06¼
No. 480 Oil Proof Resin*	lb.	—	- .18
Ohopex Q10* (dms.)	lb.	.29½	- .32½
R9* (dms.)	lb.	.35½	- .37¾
Ortho-Nitrobiphenyl	lb.	.13	- .15
Ozokerite Wax, White and Yellow	lb.	.24	- .31
Paradene Resins (dms.)	lb.	.07¼	- .08
No. 2 Flaked	lb.	.08	- .08½
Para Flux* (dms.)	gal.	.19¼	- .20¼
2016* (dms.)	gal.	.22	- .23
Para Lube* (l.c.l.)	lb.	.046	- .048
Paraplex G-25*	lb.	.76	- .77
G-40*	lb.	.50	- .51
G-50*	lb.	.40¾	- .41¾
G-53*	lb.	.45	- .46
G-60* (and G-61*)	lb.	.35	- .36
G-62*	lb.	.37	- .38
Parmo*	lb.	.06	- .13½
Pejton 22 Plasticizer*	lb.	.81	- .84
PG-16*	lb.	—	- .35
Philrich-5* (t.c.)	gal.	—	- .11
Picco 10* (and 25*)	lb.	.15	- .17
60* (and 75*)	lb.	.15	- .17
100*	lb.	.15	- .17
Piccocizer 30*	lb.	.05½	- .07
Piccolastic A* (B*, C*, D* & E*)	lb.	.28	- .29
FT* (FHF* & FX*)	lb.	.1815	- .1965
T-135*	lb.	.22¼	- .23¼
Piccolyte S Resins*	lb.	.20½	- .22¾
Piccopale Resins*	lb.	.12	- .13
Piccoumaron Resins*	lb.	.07	- .24½
Pigmentar*	lb.	.0460	- .0745
Pigmentaroil*	lb.	.0460	- .0745
Plastac M*	lb.	—	- .09¼
Plasticizer 2286*	lb.	—	- .26¼
Plasticizer 4141*	lb.	.56¼	- .66¾
Plasticizer DP-200, DP-250, DP-520*	lb.	.42¼	- .46¼
Plasticizer LP*	lb.	—	- .07
Plasticizer MP*	lb.	—	- .08
Plasticizer MT-511*	lb.	—	- .68¾
Plasticizer ODN*	lb.	.34	- .40
Plasticizer SC*	lb.	.50	- .51
Plasticizer W-13*	lb.	.37	- .38¾
Plastoflex 3*	lb.	—	- .52
52*	lb.	.37¾	- .38¾
VS*	lb.	.41¾	- .42¾
Plastogen*	lb.	.08½	- .08½
Plastolein 9050* (c.l.)	lb.	.54½	- .56½
9055*	lb.	.30½	- .32½
9058*	lb.	.48	- .50
9250*	lb.	.38¼	- .40¼
9715*	lb.	.39	- .40
Plastone*	lb.	.23	- .27
Polycizer 162*	lb.	.28½	- .32
332*	lb.	.40	- .42½
562*	lb.	.28½	- .32
662*	lb.	.30½	- .33
532 and 632*	lb.	.40	- .42½
ED*	lb.	—	- .51
Polyco 438*	lb.	.34	- .35
Polymel C-130*	lb.	.19½	- .20½
D*	lb.	.23½	- .24½
6*	lb.	.05¾	- .07¾
Process Oil C-255* (c.l.)	gal.	—	- .22
Propylene Stearate (dms.)	lb.	—	- .32
PRR 1*	gal.	.15	- .35
PT 67 Light Pine Oil* (dms.)	gal.	—	- .60
101 Pine Tar Oil* (t.c., dms.)	gal.	.0460	- .0634
400 Pine Tar* (600* & 800*) (t.c., dms.)	lb.	.0460	- .0634
PX-104*	lb.	.30	- .32½
PX-108*	lb.	.30½	- .33
PX-138*	lb.	.32½	- .33½
PX-208*	lb.	.44½	- .45½
PX-238*	lb.	.44½	- .45½
PX-404*	lb.	.66	- .67
PX-438*	lb.	.60	- .61
PX-800*	lb.	.34	- .35
PX-917*	lb.	.36½	- .37½
Reogen*	lb.	.13¾	- .14
465 Resin* (dms.)	lb.	.07½	- .08
Resin C*	lb.	.0225	- .0310
Resinex*	lb.	.03¼	- .04¾
L-4*	lb.	.02¼	- .03¼
Rexflex*	lb.	—	- .15
Rosin Oil	gal.	.80	- 1.35
RR-10 (Neoprene)*	lb.		- .37
R.S.O. Softening Oil*	lb.	.03	- .05
RuBars*	lb.	.19¼	- .20
Rubberol*	lb.	.18	- .25¾
Santicizer B-16*	lb.	.48¾	- .49¾
E-15*	lb.	.52¾	- .53¾
M-17*	lb.	.44¾	- .45¾
No. 140*	lb.	.36½	- .37½
No. 141*	lb.	.36	- .37
No. 160*	lb.	.28½	- .29½
No. 602*	lb.	—	- .30½
No. 603*	lb.	—	- .27
Sherolatum*	lb.	.03½	- .06
Staflex DBES*	lb.	.58	- .60½
DOS*	lb.	.58	- .60½
IXA*	lb.	.32	- .35
KA*	lb.	.36	- .38¾
Stan Chlor Oils*	lb.	.13½	- .20½
70*	lb.	.17½	- .30
Stanolind Petrolatum*	lb.	.07	- .156
Wax*	lb.	.31	- .33
Sunny South Burgundy Pitch*	lb.	.1030	- .1085
Pine Tar*	lb.	.0460	- .0801
Pine Tar Oil*	lb.	.0460	- .0745
Rosin Oil*	gal.	.58	- .87½

PLASTICIZERS & SOFTENERS (Cont'd)

Superla Wax*	lb.	.30	- .397
Syncera Wax*	lb.	.16	- .267
Syn Tac* (c.l.)	gal.	—	- .33
Synthetic Revertant Oil	lb.	—	- .16
Tar, Refined	gal.	.1200	- .1760
Tarpine	lb.	.035	- .050
Terpene A*	gal.	—	- .65
TP-90B*	lb.	.59	- .69
TP-95*	lb.	.65	- .74
Transphalt Resins*	lb.	.02¼	- .04¾
Tributyl Phosphate	lb.	.50	- .53½
Tricresyl Phosphate	lb.	.34½	- .37½
Turgum S*	lb.	.10¾	- .11¾
Vanadiset B*	lb.	.036	- .07
C*	lb.	.031	- .06
MR 80 Mesh*	lb.	.08½	- .12½
Vistac No. 1*	gal.	1.00	- 1.21
P*	lb.	.18	- .18½
Vopcolene 50*	lb.	—	- .37
Witcizer 100*	lb.	.20¼	- .21¼
200*	lb.	.20¼	- .21¼
201*	lb.	.22¾	- .25¼
300*	lb.	.30	- .33½
312*	lb.	.30½	- .34
313*	lb.	.30½	- .34
412*	lb.	.42½	- .46
Witresin*	ton	—	- 52.50

PROCESSING AIDS

Castor Oil, Blown (dms.)	lb.	—	- .21
Refined (dms.)	lb.	—	- .18½
Castorwax*	lb.	—	- .24½
Dutrex 7*	lb.	.12	- .20
ELA*	lb.	—	- .82
Hydrofol Glycerides 200*	lb.	.15½	- .19¾
Kenflex N*	lb.	—	- .18
Maleic Anhydride	lb.	—	- .27
Millrex*	lb.	—	- .15
Nadic Anhydride	lb.	—	- .75
Polycin*	lb.	—	- .24½
Resin No. 510*	lb.	.19	- .26
No. 529*	lb.	.25	- .32
Pulverized*	lb.	.20½	- .25
Thiomalic Acid	lb.	—	- 3.50
Zyrox*	lb.	.50	- .79

PROTECTIVE & STABILIZING AGENTS

Acacia*	lb.	.12¼	- .21
Alpha Protein	lb.	—	- .23
Aroostoocrat*	lb.	—	- .07½
Carob Bean Flour	lb.	—	- .40
Casein	lb.	.32	- .38
Emcol K-8300* (dms.)	lb.	.14	- .18
Ethylene Diamine 68%	lb.	.44	- .47
Gum Arabic	lb.	—	- .23
Karaya Gum	lb.	—	- .35
Locust Bean Gum	lb.	—	- .31
Prosein*	lb.	—	- .06
Stablex B*	lb.	.50	- .95
K*	lb.	.27	- .35

RECLAIMING AGENTS

Amalgamator Z-4*	lb.	.32	- .33
Armeen C*	lb.	.46	- .52
Mixed Crude*	lb.	.19	- .25
T*	lb.	.32	- .38
Burco RA*	lb.	.051	- .081
C-6 Oil* (28* & 32*)	gal.	.33	- .38
C-10 Oil*	gal.	.25	- .30
C-33* (t.c.)	gal.	—	- .21½
C-42* (t.c.)	gal.	—	- .23
Caustic Soda—Flake 76% (c.l., dms.)	cwt.	—	- 4.50
Liquid 50% (t.c.)	cwt.	—	- 2.80
Solid 76% (c.l., dms.)	cwt.	—	- 4.10
Cresylic Acid (99-100%)	gal.	.85	- 1.39
D-4* (t.c.)	gal.	—	- .27
E-5* (t.c.)	gal.	—	- .25
Flake Calcium Chloride (77-80%)	ton	—	- 29.00
G.B. Reclaiming Oil*	gal.	.12	- .18
CD-10*	gal.	.10	- .16
CD-50-U*	gal.	.18	- .24
Gensol No. 6* (t.c.)	gal.	—	- .40
Heavy Aromatic Naphtha	gal.	.13¼	- .18½
LX-77 Reclaiming Solvent*	gal.	.21	- .33
LX-572 Reclaiming Oil*	gal.	.27	- .32
LX-777 Reclaiming Oil*	gal.	.23	- .33
Neo-Fat D-242*	lb.	.05½	- .07¾
42-70*	lb.	.08¼	- .10¼
No. 517 H.B. Oil*	gal.	.11½	- .16½
535*	gal.	.22	- .27
PT 67 Light Pine Oil* (dms.)	gal.	—	- .60
PT 101 Pine Tar Oil* (t.c., dms.)	gal.	.0460	- .0634
PT 150 Pine Solvents* (dms.)	gal.	—	- .44
Q Oil* (t.c.)	gal.	—	- .286
Reclaiming Oil 3186-G*	gal.	.25	- .36½
Reclaiming Reagent No. 1431*	lb.	.21	- .25
R.P.A. No. 3*	lb.	—	- .47
RR-10*	lb.	—	- .37
Soda Ash (c.l., bags)	cwt.	—	- 1.75
Solvent 534*	gal.	.20½	- .26½
Solvent Oil 21*	gal.	.24	- .29
C-42*	gal.	.23	- .38
X-1 Resinous Oil*	lb.	.0225	- .0325

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REINFORCING AGENTS—CARBON BLACK

Channel, Hard Processing (HPC) (bags)

Atlantic HPC-98*	lb.	.0725	- .1225
Continental F*	lb.	.0725	- .1225
Croflex*	lb.	.0725	- .1225
Dixiedensed (and S)*	lb.	.0725	- .1225
Kosmobile (and S)*	lb.	.0725	- .1225
Micronex HPC*	lb.	.0725	- .1225
Witco No. 6*	lb.	.0725	- .1225

Channel, Medium Processing (MPC) (bags)

Arrow MPC*	lb.	.0725	- .1100
Atlantic MPC-95*	lb.	.0725	- .1225
Continental A*	lb.	.0725	- .1225
Croflex TH*	lb.	.0725	- .1225
Dixiedensed HM (and S-66)	lb.	.0725	- .1225
Kosmobile HM (and S-66)	lb.	.0725	- .1225
Micronex Standard*	lb.	.0725	- .1225
Spheron 6*	lb.	.0725	- .1225
Texas M*	lb.	.0700	- .1225
Witco No. 1*	lb.	.0725	- .1225

Channel, Easy Processing (EPC) (bags)

Atlantic EPC E-42*	lb.	.0725	- .1225
Colloearb*	lb.	.0590	- .0990
Continental AA*	lb.	.0725	- .1225
Croflex 77*	lb.	.0725	- .1225
Dixiedensed 77*	lb.	.0725	- .1225
Kosmobile 77*	lb.	.0725	- .1225
Micronex W-6*	lb.	.0725	- .1225
Spheron 9*	lb.	.0725	- .1225
Texas E*	lb.	.0700	- .1225
Witco No. 12*	lb.	.0725	- .1225
Wyex EPC*	lb.	.0725	- .1100

Channel, Conductive (CC) (bags)

Continental R-40*	lb.	.2400	- .3200
Dixie 5 Dustless*	lb.	.1200	- .1900
Dixie Voltex*	lb.	.2400	- .3200
Kosmink Dustless*	lb.	.1200	- .1900
Kosmos Voltex*	lb.	.2400	- .3200
Spheron C*	lb.	.1500	- .1950
Voltex*	lb.	.2400	- .3200

Channel, Surface Treated (STC) (bags)

Texas 109*	lb.	.0790	- .1275

Conductive Furnace Black (CF) (bags)

Aromex CF*	lb.	.0825	- .1200
Atlantic CF*	lb.	.0875	- .1350
Continex CF*	lb.	.1000	- .1400
Croflex CF*	lb.	.0875	- .1350
Dixie CF*	lb.	.0875	- .1350
Kosmos CF*	lb.	.0875	- .1350
Shawinigan Acetylene Black*	lb.	.1700	- .2600
Vulcan C*	lb.	.1050	- .1500

Extra-Conductive Furnace Black (ECF) (bags)

Vulcan XC-72	lb.	.1775	- .2700

Furnace, Fast Extruding (FEF) (bags)

Arovel FEF*	lb.	.0625	- .1000
Continex FEF*	lb.	.0625	- .1000
Croflex 50*	lb.	.0625	- .1000
Dixie 50*	lb.	.0625	- .1000
Kosmos 50*	lb.	.0625	- .1000
Philblack A*	lb.	.0600	- .1000
Statex M*	lb.	.0625	- .1000
Sterling SO*	lb.	.0625	- .1000

Furnace, Fine (FF) (bags)

Statex B*	lb.	.0675	- .1050
Sterling 99*	lb.	.0675	- .1050

Furnace, General Purpose (GPF) (bags)

Arogen GPF*	lb.	.0550	- .0900
Dixie 35*	lb.	.0550	- .0900
Kosmos 35*	lb.	.0550	- .0900
Sterling V*	lb.	.0550	- .0900
V (Non-Staining)	lb.	.0500	- .0900

Furnace, High Abrasion (HAF) (bags)

Aromex HAF*	lb.	.0725	- .1100
Continex HAF*	lb.	.0725	- .1200
Croflex 60*	lb.	.0725	- .1140
Dixie 60*	lb.	.0725	- .1140
Kosmos 60*	lb.	.0725	- .1140
Philblack O*	lb.	.0700	- .1100
Statex R*	lb.	.0725	- .1200
Vulcan 3*	lb.	.0725	- .1140

Furnace, High Modulus (HMF) (bags)

Continex HMF*	lb.	.0575	- .0950
Croflex 40*	lb.	.0575	- .0950
Dixie 40*	lb.	.0575	- .0950
Kosmos 40*	lb.	.0575	- .0950
Medulex HMF*	lb.	.0575	- .0925
Statex 93*	lb.	.0575	- .0950
930*	lb.	.0575	- .0950
Sterling L*	lb.	.0575	- .0950
LL*	lb.	.0575	- .0950

REINFORCING AGENTS—CARBON BLACK (Cont'd)

Furnace, Semi-Reinforcing (SRF) (bags)

Continex SRF*	lb.	.0525	- .0875
Croflex 20*	lb.	.0575	- .0875
Dixie 20*	lb.	.0575	- .0875
Essex SRF*	lb.	.0575	- .0875
Furnex*	lb.	.0525	- .0875
Gastex*	lb.	.0575	- .0925
Kosmos 20*	lb.	.0525	- .0875
Pelletex*	lb.	.0525	- .0875
NS*	lb.	.0525	- .0875
Shawinigan Acetylene Black*	lb.	.1700	- .2600
Sterling NS*	lb.	.0525	- .0875
R*	lb.	.0575	- .0925
S*	lb.	.0525	- .0875

Furnace Super Abrasion (SAF) (bags)

Dixie 85	lb.	.1150	- .1650
Kosmos 85	lb.	.1150	- .1650
Philblack E*	lb.	.1150	- .1550
Vulcan 9*	lb.	.1150	- .1650

Furnace, Super Abrasion, Intermediate (ISAF) (bags)

Aromex ISAF*	lb.	.0875	- .1250
Continex ISAF*	lb.	.0875	- .1350
Dixie 70*	lb.	.0875	- .1350
Kosmos 70*	lb.	.0875	- .1350
Philblack I*	lb.	.0850	- .1250
Statex 125*	lb.	.0875	- .1350
Vulcan 6*	lb.	.0875	- .1300

Furnace, Super Conductive (SCF) (bags)

Vulcan SC*	lb.	.1800	- .2230

Thermal, Fine (FT) (bags)

P-33 (c.l.)*	lb.	—	- .0575
Sterling FT (c.l.)*	lb.	—	- .0575

Thermal, Medium (MT) (bags)

Shellblack*(†)	lb.	—	- .0250
Sterling MT (c.l.)*	lb.	—	- .0400
MT Non-Staining (c.l.)*	lb.	—	- .0500
Thermax (c.l.)*	lb.	—	- .0400
Stainless (c.l.)	lb.	—	- .0500

REINFORCING AGENTS—SILICA

Cab-O-Sil (compressed)*	lb.	.68	- .75
Cab-O-Sil (uncompressed)*	lb.	.68	- .75
D. C. Silica (pelletized)*	lb.	1.45	- 1.65
Hi-Sil 101*	lb.	.11	- .12½
233*	lb.	.09	- .10½
X303*	lb.	.40	- .45
Santocel*	lb.	.62	- .64
Valron Estersil*	lb.	2.00	- 2.25

REINFORCING AGENTS—MISCELLANEOUS

Angelo Shellac*	lb.	.50	- .60
Darex Copolymer No. 3*	lb.	.47	- .49
43G*	lb.	.39	- .41
Darex Copolymer Latex No. 3-L	lb.	.41½	- .46
Durez 12687 (and 12707)*	lb.	—	- .38½
Durez 13355*	lb.	—	- .30
Good-rite Resin 50*	lb.	.39	- .41
Hystron*	lb.	.39	- .41
Kralac A-EP*	lb.	.39	- .41
Lampblack	lb.	—	- .12
Marbon S and S-1*	lb.	.39	- .41
8000*	lb.	.39	- .41
Marmix*	lb.	.39	- .41
Pliolite Latex 150*	lb.	.35	- .39
Pliolite Resin-Rubber Masterbatches*	lb.	.33	- .57
Pliolite NR*	lb.	.93	- .95
S6B*	lb.	.39	- .41
Plio-Tuf G85C*	lb.	.52	- .54
Polyco 220*	lb.	.18¼	- .19¼
Polypol S-70*	lb.	.22	- .23

RETARDERS

Benzoic Acid TBAO-2*	lb.	—	- .44
Dutch Boy Normasal*	lb.	—	- .46
ESEN*	lb.	.35	- .37
Good-rite Vultrol*	lb.	.62	- .64
Harcopol 1183*	lb.	.70	- .74
Retarder J*	lb.	.62	- .64
PD*	lb.	.37	- .39
W*	lb.	—	- .42
Retardex*	lb.	.47	- .50

RUBBER SUBSTITUTES

Mineral Rubber

Byerlyte*	ton	50.00	- 57.00
Hard Hydrocarbon (dms.)*	ton	53.00	- 55.00
Herron Flake*	ton	—	- 45.00
Mineral Rubber, Solid	ton	42.50	- 44.50
M. R. No. 38*	ton	55.00	- 65.00
Witresin	ton	—	- 52.50

Vulcanized Vegetable Oils

Amberex*	lb.	.29	- .36
Brown	lb.	.15	- .24
Car-Bel-Lite*	lb.	.3000	- .3300
Neophax*	lb.	.17	- .27
Polyrez A and C*	lb.	.12	- .17
White	lb.	.15	- .26

Miscellaneous Rubber Substitutes

G.B. Asphaltenes*	lb.	.06	- .06½
Gilsowax B*	lb.	.09	- .11
Resin No. 1098 (dms.)	lb.	—	- .62
No. 1198*	lb.	.46¾	- .49¾
Tysonite*	lb.	.26	- .26¾

SOLVENTS

Acetone (dlvd.)	lb.	.08	- .10½
Amsco Lactol Spirits* (t.c.)	gal.	—	- .19
Naphthol Spirits*	gal.	—	- .18
Mineral Spirits*	gal.	—	- .17
Rubber Solvent* (t.c.)	gal.	—	- .18
Solv A* (t.c.)	gal.	—	- .24½
Solv A-80* (t.c.)	gal.	—	- .30
Solv B* (t.c.)	gal.	—	- .28½
Solv B-90* (t.c.)	gal.	—	- .32
Solv D* (t.c.)	gal.	—	- .30
Solv E*	gal.	—	- .30
Solv F*	gal.	—	- .30
Solv F-80*	gal.	—	- .32½
Solv G*	gal.	—	- .42½
Special Naphtholite* (t.c.)	gal.	—	- .18
Special Textile Spirits*	gal.	—	- .19
Super Hi-Flash Naphtha*	gal.	—	- .35
Super Naphtholite*	gal.	—	- .18
Textile Spirits* (t.c.)	gal.	—	- .19
Amyl Chlorides, Mixed (t.c.l.) (dms.)	lb.	.09¼	- .10¼
Benzol 90%	gal.	.36	- .40
Butyl Acetate (t.c.)	lb.	—	- .13½
Butyl Alcohol (t.c.)	lb.	—	- .13½
Secondary (dlvd.)	lb.	.14	- .15
Tertiary (dlvd.)	lb.	.14½	- .15½
Carbon Bisulfide, Tech.	lb.	.05½	- .07½
Carbon Tetrachloride	lb.	.10	- .13½
Cosol 1*	gal.	.37	- .43
2*	gal.	.42	- .48
Cyclohexane	gal.	.55	- .72
85% (c.l.) (dms.)	gal.	—	- .56
Cyclohexanone	lb.	.29	- .31½
Diacetone, Pure (dlvd.)	lb.	.12½	- .15
Dichlorethyl Ether (dms.)	lb.	.14½	- .15
Formal (dms.)	lb.	.30¾	- .31¾
Dichloropentane	lb.	.04¼	- .14¾
Dicom*	gal.	—	- .50
Halowax Oil*	lb.	.28	- .41
Heptanes* (t.c.)	gal.	.19	- .22
Hexanes (t.c.)	gal.	.19	- .22
Isopropyl Alcohol, Ref. 99% (dlvd.)	gal.	.41	- .57
Ether, Ref. (dlvd.)	lb.	.07	- .09½
Mersol*	gal.	.43	- .7[illegible]
Mesityl Oxide (dlvd.)	lb.	.11½	- .14
Methyl Acetone, Syn. (dms., dlvd.)	gal.	.57	- .63
Methyl Chloride	lb.	—	- .11½
Methyl Ethyl Ketone	lb.	.12	- .14½
Methyl Isobutyl Ketone (dlvd.)	lb.	.14	- .16½
Methylene Chloride	lb.	.11¾	- .16
N-5 Pentane Mix* (t.c.)	gal.	—	- .13½
N-6 Hexanes* (t.c.)	gal.	—	- .14½
N-7 Hexanes* (t.c.)	gal.	—	- .13½
Penetrell*	gal.	.40	- .62
Perchlorethylene	lb.	.11½	- .14½
Petrolene* (t.c.)	gal.	—	- .14125
Picolines, Alpha, Refined	lb.	.43½	- .44
Mixed	lb.	.32½	- .33
Proprietary Solvent (dms.)	gal.	.66	- .77
Propyl Acetate (t.c., dlvd.)	lb.	—	- .11¾
Alcohol (t.c., dlvd.)	lb.	—	- .11
PT 150 Pine Solvent* (dms.)	gal.	—	- .44
Pyridine, Refined	lb.	.74½	- .75
Quinoline	lb.	.50	- .54¼
Rubber Solvent (t.c.)	gal.	—	- .16
Rubsol (t.c.)	gal.	—	- .12875
Skellysolve B (Hexanes)* (t.c.)	gal.	—	- .158
C (Heptanes)* (t.c.)	gal.	—	- .151
R (Rubber Solvent)*	gal.	—	- 1.29
Solvent, Crude, Light	gal.	.19	- .28
Solvesso 100* (t.c.)	gal.	.33	- .35
150 (t.c.)	gal.	.33	- —
Sunny South DD Dipentine*	gal.	.40	- .62
Sunny South DD Pine Oil*	lb.	.12¾	- .14¼

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SOLVENTS (Cont'd)

Sunray*	gal.	.1140	.1600
Toluene (dms.)	gal.	——	.38
Toluol (t.c.)	gal.	.33	.35
Trichlorethane	lb.	.13	.13½
Triglycol Dichloride	lb.	.63	.64
Union Thinner 1* (t.c.)	gal.	——	.174
5* (dms.)	gal.	——	.199
7* (t.c.)	gal.	——	.164
2-50 W Hi-Flash*	gal.	——	.41
Xylol	gal.	.34	.38

STABILIZING AGENTS (for Vinyl Resins)

Advastab BC-12*	lb.	.90	.95
BC-74*	lb.	.70	.75
BC-105*	lb.	.75	.80
CH-101*	lb.	.60	.65
CH-201*	lb.	.60	.65
E-82*	lb.	.90	.95
JCX*	lb.	.62	.67
L Paste*	lb.	.65	.70
SN*	lb.	.47	.52
T-10*	lb.	1.90	1.95
T-50-LT*	lb.	3.20	3.25
XBZ-155*	lb.	.69	.74
XC-143*	lb.	.90	.95
XE-98*	lb.	.53	.58
Barca 10*	lb.	.75	.80
Barium Ricinoleate (BVS)	lb.	——	.70
Barium Stearate	lb.	.39	.44
Basic Silicate White Lead	lb.	.20¼	.21¼
Cadmium Ricinoleate	lb.	——	2.00
Calcium Ricinoleate	lb.	——	.55
Dutch Boy DS-207*	lb.	——	.54
Plumb-O-Sil A*	lb.	——	.29¼
B*	lb.	——	.31¼
Tribase*	lb.	——	.26½
Dythal*	lb.	——	.39½
Ferro 182* (dms.)	lb.	.70	.76
200* (dms.)	lb.	1.33	1.43
203* (dms.)	lb.	.85	.95
541* (dms.)	lb.	.35½	.45½
541A* (dms.)	lb.	.81¾	.91¾
700* (dms.)	lb.	.48¾	.58¾
900* (dms.)	lb.	.90	1.00
903* (dms.)	lb.	.55	.65
909* (dms.)	lb.	.91	1.01
920*	lb.	——	.98
931* (dms.)	lb.	.75¾	.85¾
993* (dms.)	lb.	.89	.99
1203* (dms.)	lb.	1.30	1.40
1206* (dms.)	lb.	1.23	1.33
1820* (dms.)	lb.	.90	1.00
1825* (dms.)	lb.	1.00	1.10
Permyl A	lb.	.45	.55
Harshaw 1-V-3*	lb.	——	.43
1-V-4*	lb.	——	.68
1-V-7*	lb.	——	.66
2-V-4*	lb.	——	.90
2-V-7*	lb.	——	1.10
2-V-8*	lb.	——	1.30
5-V-1*	lb.	——	.41
7-V-1*	lb.	——	.90
8-V-1*	lb.	——	1.15
8-V-5*	lb.	——	.80
8-V-100*	lb.	——	.84
9-V-1*	lb.	——	.76
12-V-5*	lb.	——	.75
24-V-1*	lb.	——	1.28
28-V-2*	lb.	——	1.18
128-V-5*	lb.	——	.86
Lithium Stearate	lb.	.52	.57
Fluffy	lb.	.47½	.70
Standard	lb.	.52½	.75
Mark C*	lb.	.88	.90
E*	lb.	.72	.75
M*	lb.	.68	.70
PL*	lb.	.63	.65
TT*	lb.	.72	.75
WS*	lb.	.98	1.00
X*	lb.	2.50	2.75
XI*	lb.	.87	.90
XV*	lb.	.88	.90
XX*	lb.	.58	.60
Metasap 613-A*	lb.	——	.69
613-B*	lb.	——	.84
613-C*	lb.	——	1.06
621*	lb.	——	.88
624*	lb.	——	.75
633*	lb.	——	.75
635*	lb.	——	.45
Modicol N*	lb.	.41½	.42½
S*	lb.	.30¾	.31¾
Sodium Silicates 41°/1:32	cwt.	1.00	2.10
Stabelan E*	lb.	1.35	1.50
XL*	lb.	.55	.65
HR-50*	lb.	.75	.90
HR Liquid*	lb.	.65	.75
HR Paste*	lb.	.85	.95
HR Powder*	lb.	.95	1.05
No. 110 Liquid	lb.	.65	.75
No. 115 Liquid	lb.	.85	.95
No. 120 Liquid	lb.	.65	.75
Stabilizer No. 52*	lb.	1.90	2.00
89X*	lb.	.75	.80
B-5*	lb.	——	.70
E6B*	lb.	——	.95
G-1*	lb.	1.25	1.40
HR*	lb.	.85	.89
I*	lb.	——	.60
OM-10*	lb.	——	1.95
Staflex OY*	lb.	1.00	1.20
QXMA*	lb.	——	.70

STABILIZING AGENTS (Cont'd)

Stayrite 10*	lb.	.34	.36
P-10*	lb.	.41	.43
15*	lb.	.53	.58
20*	lb.	.37	.42
22*	lb.	1.00	1.13
25*	lb.	.35	.40
70*	lb.	.68	.70
71*	lb.	.88	.90
75*	lb.	.59	.62
76*	lb.	.53	.55
80*	lb.	.68	.70
90*	lb.	.68	.70
95*	lb.	.68	.70
229*	lb.	.45	.50
Vanstay L*	lb.	.33	.35
H.T.*	lb.	.90	.92
S*	lb.	.63	.65

STIFFENING AGENTS

Polyac*	lb.	——	1.80
Processing Stiffener 710*	lb.	——	.88
Solvitose HDF, H, C-S, T, and E*	lb.	.22	.25
Versatil Gum 8-E*	lb.	.15	.19

SUN CHECKING AGENTS

Allied AA-1144*	lb.	.23	.24
AA-1177*	lb.	.15½	.16½
Antisol*	lb.	——	.23
Antisun* (Chipped)	lb.	.15½	.17½
(Slabbed)	lb.	.15	.17
Heliozone*	lb.	.31	.32
Microflake*	lb.	.20	.24
Nacconol NRSF*	lb.	.40½	.45
NBC*	lb.	——	1.55
Ross Sunproofing Waxes*	lb.	——	.14½
Sunolite*	lb.	.16	.22
127*	lb.	.16½	.20½
154*	lb.	.23	.25
Sunproof*	lb.	.31	.32
713*	lb.	.25	.26
Improved*	lb.	.25	.26
Super*	lb.	.40	.41
Jr.*	lb.	.20	.21
Tonox*	lb.	.52	.54

SURFACE ACTIVE AGENTS

Anhydrapent*	lb.	.56	.59
Anhydrol 6990*	lb.	.51	.56
6991*	lb.	.51	.56
Aquarex D*	lb.	——	.78
G*	lb.	——	.21
MDL*	lb.	——	.33
ME*	lb.	——	.80
NS*	lb.	——	.60
SMO*	lb.	——	.50
WAQ*	lb.	——	.22
Emulphor EL-620*	lb.	——	.40
EL-719*	lb.	——	.58
ON-870*	lb.	——	.55
Igepal CA-630	lb.	——	.29
CO-630	lb.	——	.29
CO-730	lb.	——	.29
CO-850*	lb.	——	.29
CO-880*	lb.	——	.29
Igepon CN-42*	lb.	——	.25
T-33*	lb.	——	.21
T-51*	lb.	——	.13½
T-77*	lb.	——	.49
Kessco 50201*	lb.	——	.43½
50203*	lb.	——	.46
18201*	lb.	——	.36½
18203*	lb.	——	.36
Pluronic L62*	lb.	.33½	.39
L64*	lb.	.33½	.39
Sellogen Gel*	lb.	——	.12¾
Soybean Lecithin	lb.	.13	.17

TACKIFIERS

Amalgamator Z-4*	lb.	.32	.33
Arcco 620-32B*	lb.	.20½	.21½
716-30*	lb.	.18½	.19½
1041-21*	lb.	.16½	.17½
A-26*	lb.	.18	.19
Bunaweld Polymer No. 780*	lb.	——	.24
No. 5514*	lb.	——	.35
Galex* (dms.)	lb.	.17¾	.18¼
Indopol H-300*	gal.	1.00	1.22
Koresin*	lb.	——	.95
Liquid Rubber Flux*	lb.	——	.14
Nacconal NRSF* (dlvd.)	lb.	.40½	.45
Nilox Resin* (c.l.)	cwt.	——	14.50
Resin V	lb.	——	.23½
Synthol*	lb.	.17	.24¾
Vistac A*	lb.	.21½	.22¾
Zirex* (c.l.)	cwt.	——	14.75

THICKENERS (For Latex)

Alcogum AN-6*	lb.	——	.05
AN-10*	lb.	——	.08½
PA-10*	lb.	——	.12
Betanol* (dms.)	lb.	.70	.95
Gomme Labolene*	lb.	.45	.47
Good-rite K-702*	lb.	.34½	.35
K-704*	lb.	.21	.22
K-705*	lb.	.31	.32
K-707*	lb.	.18	.19
K-708*	lb.	.29	.30
K-710*	lb.	.15	.16
Modicol VD*	lb.	.13½	.14½
VE*	lb.	.13½	.14½
Polyco 296 BT*	lb.	.15	.16
296-N*	lb.	.15	.16
530*	lb.	.15	.16
Propylene Laurate (dms.)	lb.	.57	.82

THICKENERS (For Latex) (Cont'd)

Sodium Silicate, 41°/1:3.2	cwt.	1.10	2.20
Solvitose Series*	lb.	.22	.25

VULCANIZING AGENTS

Selenium

Vandex*	lb.	——	15.50

Sulfur

Aero Brand* (c.l.)	cwt.	——	2.65
Blackbird* (c.l.)	cwt.	——	2.85
Cloud* (c.l.)	cwt.	——	2.80
Crystex*	lb.	.19½	.23
Darex Dispersed Sulfur*	lb.	.14	.16
Devil A* (c.l.)	cwt.	——	2.40
Dispersed Sulfur	lb.	.14	.16
Insoluble Sulfur 60*	lb.	.12½	.13
Ko-Blend IS*	lb.	——	.39
Mist* (Wettable) (c.l.)	cwt.	——	4.00
Spider* (c.l.)	cwt.	——	2.80
Star* (c.l.)	cwt.	——	3.25
Sulfasan R*	lb.	——	1.50
Tire* (c.l.)	cwt.	——	2.40
Tube* (c.l.)	cwt.	——	3.25
Vultac 2*	lb.	.47	.49
3*	lb.	.51	.53

Tellurium

Telloy*	lb.	——	2.50

WETTING AGENTS

Advawet No. 10*	lb.	——	.17
No. 33*	lb.	——	.48
Aerosol 18*	lb.	——	.40
AY*	lb.	1.00	1.20
MA 80%*	lb.	.67	.72
OS*	lb.	.39	.45
OT 75% Aqueous*	lb.	.63	.68
OT 100%*	lb.	1.00	1.20
OT-B*	lb.	.85	1.05
Alrosal* (dms.)	lb.	——	.40
Alrosperse*	lb.	——	.18
Anhydrol 6990* and 6991*	lb.	.51	.56
Areskap 50*	lb.	.30	.32
Dry 100*	lb.	.60	.64
Aresket Dry 300*	lb.	.60	.64
Aresklene 375*	lb.	.42	.47
Armacs*	lb.	.28	.77
Arquads*	lb.	.42	.61
Emcol 5100* (dms.)	lb.	——	.31
Etho-Chemicals*	lb.	.26	.58
Ethomeen S/15*	lb.	.48	.50
T/15*	lb.	.46	.48
Kesco E-122* (dms.)	lb.	——	.45
18201*	lb.	——	.38½
Kreelon 4D* (dms.)	lb.	.13	.16
8G* (dms.)	lb.	.26	.28
Kyro EO* (dms.)	lb.	——	.29¾
Modicol N*	lb.	.41½	.42½
S*	lb.	.30¾	.31¾
Nacconol SL* (dlvd.)	lb.	.084	.10
60S* (dlvd.)	lb.	.19	.225
Nacconol A* (dlvd.)	lb.	——	.52
Nekal WS-25	lb.	——	.38
WS-99	lb.	——	.95
Orvus AB Granules*	lb.	.15¾	.16¾
Parnol*	lb.	.13	.18
Santomerse No. 3	lb.	.41	.45
S*	lb.	1.55	1.85
Selapon Gel*	lb.	——	.13
Sorapon SF-73*	lb.	——	.18
SF-78*	lb.	——	.30
Sorbit P*	lb.	——	.28
Soybean Lecithin	lb.	.13	.17
Stablex G*	lb.	.50	.90
Tergitol 4* (dms., dlvd.)	lb.	.32	.33
7* (dms., dlvd.)	lb.	.43	.44
O8* (dms., dlvd.)	lb.	.31	.32
P28* (dms., dlvd.)	lb.	.18½	.19
Trenamine W-30	lb.	——	.15
Vultamol*	lb.	——	.17½
Wetsit Conc.*	lb.	.25	.28

MISCELLANEOUS CHEMICALS

Aquesperse 30*	lb.	——	.11
Arcopel W-18*	lb.	.17	.19
Asbury Graphite*	lb.	.05	1.45
Copper Inhibitor X-872-L*	lb.	——	2.01
D-Tac*	lb.	——	.22
2-Ethyl Hexanol	lb.	.23¾	.24¼
Fura-Tone Resin 1226*	lb.	.41	.43
MODX*	lb.	.32½	.34½
Nacconate 65* (dms.)	lb.	1.04	1.05
80* (dms.)	lb.	.99	1.00
100* (dms.)	lb.	1.14	1.15
200* (dms.)	lb.	——	2.00
300* (dms.)	lb.	1.74	3.53
Para Resin 2457*	lb.	.04	.04½
2702*	lb.	.04	.04½
2718*	lb.	.04	.04½
Pigmented Filmite* (dlvd.)	lb.	.16¾	——
Resorcin, Tech.	lb.	.77½	.81½
Rio Resin*	lb.	.65	.67
Rongalite CX*	lb.	——	.21½
Sherosope F*	lb.	.15½	.17¾
F-455*	lb.	.13½	.15¾
L*	lb.	.14	.16¼
N*	lb.	.15	.17¼
T*	lb.	.16½	.18¾
Sublac Resin PX-5*	lb.	.23½	.24½
Synpep*	lb.	.54	.60
Thiokol LP-2*	lb.	——	.96
LP-3, LP-32, LP-33*	lb.	——	.96
LP-8*	lb.	1.25	1.35
Tysonite*	lb.	.26	.26¼
VA-7*	lb.	——	.50
Vanfre*	gal.	2.50	3.00

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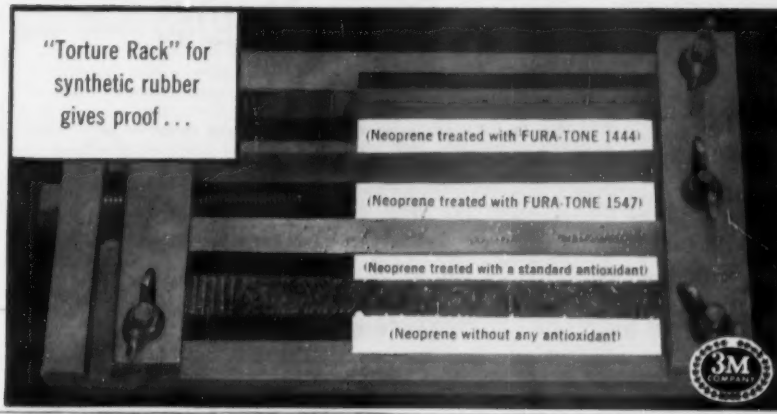
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(Neoprene treated with FURA-TONE 1547)
(Neoprene treated with a standard antioxidant)
(Neoprene without any antioxidant)
3M COMPANY

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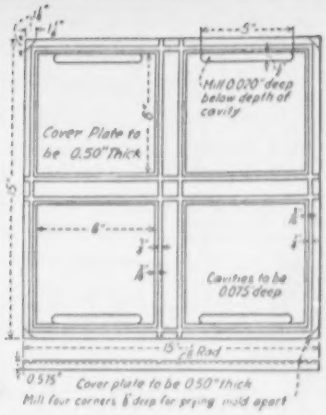
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"Help Wanted" continued on next page

HELP WANTED—Continued

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6 oz. Watson-Stillman.
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8 oz. Impco mdl. VF-8, compress. & transf. features, extra 12 oz. cyl.
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12 oz. Lester W/Glengarry weigh feed.
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40 ton, Loomis, 4 opening, 12" x 12" elec. heated platens, MD self-cont.
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50 ton, Stokes, semi-auto., self-cont.
50 ton Farrel 12" x 12" upmoving.
50 ton Watson-Stillman, 12" x 17" elec. htd. platens, MD pump.
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393 ton Farrel, 2 openings 15" steam platens 48" x 48" x 48", 4 rams 10" x 24" str.
600 ton Watson-Stillman, hobbing, motor driven pump.
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Model #W30-H-SP Buffalo, with Dexter sheet feeder.

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50 ton, Watson-Stillman, 12" x 17" elec. htd. platens, MD pump.
215 ton, Lake Erie, semi-automatic, self-cont., hydr. plastic molding.

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300 ton, Watson-Stillman hydraulic transfer press, 33" 27" platen, auto.

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Model R Stokes, single punch, variable speed motor drive, 3 HP.
Model R-1, Stokes, single punch, variable speed, MD, 3 HP.
No. RB-2 Stokes, 16 station, motor drive, 2 HP.
Model S-5 Stokes dual pressure, 40 ton, motor drive 72 HP, 1952.
Model RDS3 Stokes, 15 station, motor drive 3 HP.
Model 45 Defiance, 200 ton, 15 HP, vari-speed, MD.
No. 2RP Colton, 16 punch, rotary, motor drive 1½ HP.
No. 3RP Colton, 16 punch, rotary, motor drive 1½ HP.
No. 280G Stokes, single punch.
Model F, Stokes, single punch, MD.
No. 5 Arthur Colton, motor drive, 3 HP.
No. DD-2 Stokes, 19 stations, US vari-drive, 10 HP.
No. DDS-2 Stokes, 23 stations, US vari-drive, 10 HP.
No. DD-2 Stokes, 23 stations, Reeves vari-speed drive 7½ HP.
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Model 5½ Arthur Colton motor drive 3 HP.

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200 GPM, 2500 psi Worthington horizontal, duplex, DA 3¼" x 18".

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No. 3A Banbury, 150 HP MD rubber/plastic.
No. 9 Banbury, body only.
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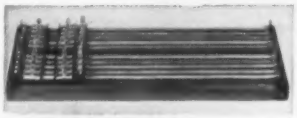

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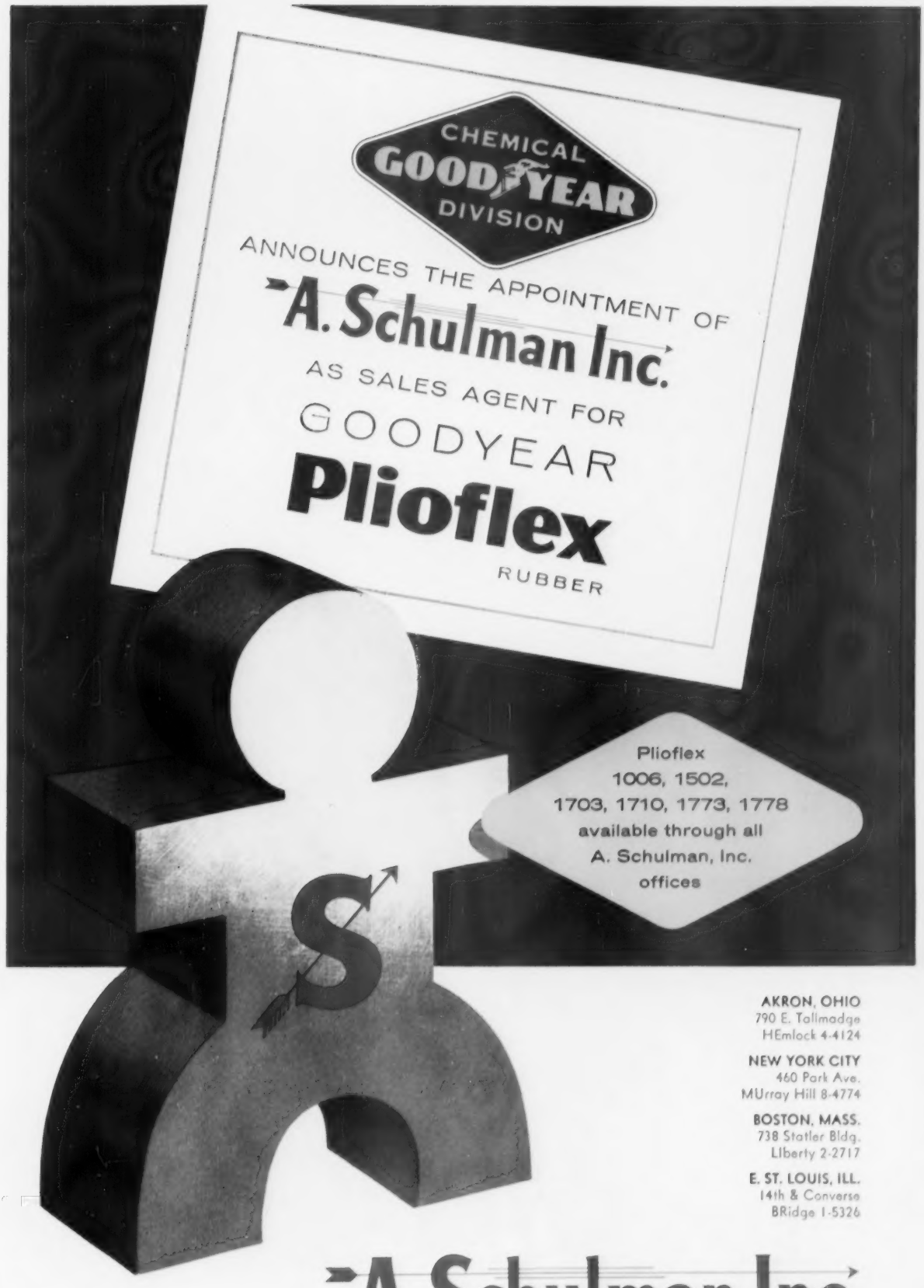

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